



FRANKIE FREQFINDER FINDS FREQUENCIES FAST NOW THAT HE HAS AN OPTOELECTRONICS FREQUENCY COUNTER

Frankie knows that only a frequency counter will give him a transmit frequency in seconds! And smart fellow that he is, Frankie also knows that Optoelectronics handheld counters are the most sensitive and have the greatest range. With several models and a complete selection of antennas to choose from. Optoelectronics counters make scanning more fun!

MODEL 1300H/A 1 MHz to 1300MHz range. Our lowest cost and most popular counter. Extremely sensitive from 27MHz up through 500MHz.

MODEL 2210 10Hz to 2.2GHz. Wider frequency range than the 1300H/A, and more sensitive above 450MHz. Great general purpose counter for every application, audio though micorwave. \$219.

MODEL CCA 10MHz through 550MHz. Designed for counter surveillance, (bug detection), features RF detector LED with variable threshold adjustment. Maximum sensitivity in the range where RF bugs operate. \$299.

All counters include NiCad Battery Pack and AC Charger/Adapter.

MODEL 2600H 1 MHz through 2.6GHz. New, 10 digit LCD counter with 16 segment bargraph that responds to RF signal/level. More resolution, reads up to 150MHz direct count (1Hz displayed in 1 second). 4 gate times, two prescalers, hold feature, low battery indicator and more. Available April. \$325.



Model 1300H/A



Model 2600H

COUNTER ANTENNAS

MODEL TA100S - General purpose wide band antenna. \$12.

MODEL RD11 -11 meter through 2 meter rubber duck. Best antenna for 27 - 100

MODEL RD100 -2 meter (150 MHz) narrow band rubber duck. \$20.

MODEL RD800 -best 800 - 1300MHz antenna. Peak resonance in cellular phone band, \$35.

SAVE \$11!! PACKAGE OF 3 ANTENNAS MODEL ANT/PACK-1 INCLUDES TA - 100S, RD11, AND RD800 for \$65.

ORDER FACTORY DIRECT. VISA, MASTER CARD ACCEPTED.

OPTOELECTRONICS INC.

5821 N.E. 14th Avenue, Fort Lauderdale, Florida 33334 1-800-327-5912 • FL (305) 771-2050 • FAX (305) 771-2052



The Mouse that Roared by Karl J. Zuk





Just about everyone who enjoys monitoring the radio has also toyed -- perhaps in secret -- with the idea of having their own radio station. Some express this urge by maintaining full-time careers in the broadcast media. Others take up ham radio. And still others take to the airwaves illegally, becoming pirate radio operators. Now it's your turn.

For a short period, before the FCC begins to formally assign stations, you can put your own station on the air in the newly expanded AM band. It's legal, there's no license needed and your

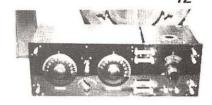
transmitter will cost under a hundred bucks. Join *Monitoring Times*' American BandScan columnist as he shows how you, too, can have the DX opportunity of a lifetime.

Old Radios Never Die by Everett Slosman

10

As remarkable as some of today's hi-tech receivers are, there's nothing that can capture the true flavor of our hobby like an old radio. Sure, they may not have many of the bells and whistles of their late model colleagues -- they may be primitive by comparison -- but they are the soul of this hobby.

Ev Slosman has been traveling the radio flea markets and shows of America in search of these receivers and their fascinating stories. and meet the machines that made our hobby what it is today.



Take a trip into the past

Wildlife Tracking in the Everglades by Robert Wyman

18

Wildlife management is a science and profession in South Florida, where a variety of environmentally-sensitive species exist in proximity to one of the fastest-growing urban areas of the country. In Everglades National Park and a number of other sites, scientists can study a living laboratory of wildlife and habitats.



In South Florida, government and private resources have been teamed to accomplish the wildlife-monitoring tasks. Jim Wyatt, owner and operator of James Wyatt Enterprises, Inc., is a private contractor to the U.S. Department of Interior/National Parks Service (NPS) who uses radio extensively in his work and who flies Cessna 172 and 182 aircraft on a variety of wildlife and environment-related missions.

ON THE COVER: African village scene. Photo by Benjie Thomas.

Zambia on Shortwave by Colin Miller



Drums used to serve as the communication link for African tribal society. But in this day and age, how do you draw together a nation the size of Texas whose citizens speak 70 different native languages? How do you bring it into modern society without losing

10

22

its cultural identities? The answer to both questions is -- through Radio!

The BBC's Pamela Creighton

She is one of the better known voices on the BBC World Service: Pamela Creighton. You may know her as one of those measured voices of reason, reading the news from Bush House in London. But to her colleagues, she is "Crisis Creighton."

Only the second woman to read the news, her career nearly ended when she took a very close World Cup soccer game off the air just moments before the winning goal was scored. She almost didn't live down the embarrassment. Meet this superb journalist on page 22 of this issue of *Monitoring Times*.

And more . . .

Equipment reviews include Larry Magne's review of the Sangean ATS808, while Bob Grove puts the Regency INF10 and the GRE Super Amplifier through their paces.

If it's a little too cold yet to think about outside antennas, Rich Arland presents a homebrew active antenna that will get you going without putting a foot out the door. On the other hand, if you are looking for an outdoor antenna, why not try Clem's "Quickie Quad" for high gain and no pain?

DEPARTMENTS

Letters	3	Outer Limits	52
Communications	4	Below 500 kHz	54
Shortwave Broadcasting	24	Program Guide	56
Utility World	28	Frequency Section	65
The Scanning Report	32	Magne Tests	86
What's New?	36	Scanner Equipment	88
Uncle Skip's Corner	38	Catalogs	90
The Federal File	40	DeMaw's Workbench	92
High Seas	42	Experimenter's Workshop	94
On the Ham Bands	44	Antenna Topics	96
The QSL Report	46	Ask Bob	98
Reading RTTY	47	Convention Calendar	101
Satellite TV	48	Stock Exchange	102
American Bandscan	50		



MONITORING TIMES (ISSN: 0889-5341) is published monthly by Grove Enterprises, Inc., Brasstown, NC, USA.

Address: P.O. Box 98, 140 Dog Branch Road, Brasstown, NC 28902 Telephone: (704) 837-9200 FAX: (704) 837-2216 (24 hrs) Subscription Rates: \$18 in U.S. and \$26 elsewhere

STAFF

Publisher
Bob Grove, WA4PYQ
Managing Editor
Larry Miller
Associate Editor
Rachel Baughn
Subscriber Services
Beverly Berrong
Advertising
Beth Leinbach
Dealerships
Judy Grove

Editorial Staff

Frequency Manager Greg Jordan Frequency Monitors Richard Keen Colin Miller Program Manager Kannon Shanmugam Program Monitors Jim Frimmel Dale Vanderpoel Reading RTTY Jack Albert, WA9FVP Uncle Skip's Corner T.J.Arey, WB2GHA Experimenter's Workshop Rich Arland, K7YHA Plane Talk Jean Baker DeMaw's Workbench Doug DeMaw SW Broadcasting Glenn Hauser High Seas James R. Hay Scanning Report Bob Kay On the Ham Bands Propagation Report Ike Kerschner, N3IK Magne Tests... Lawrence Magne Federal File Rod Pearson Satellite TV Ken Reitz, KC4GQA

Outer Limits John Santosuosso Antenna Topics Clem Small, KR6A SW Broadcast Logs QSL Corner Gayle Van Horn Utility World Larry Van Horn, N5FPW

Below 500 kHz Joe Woodlock American Bandscan Karl Zuk

Correspondence to columnists should be mailed c/o Monitoring Times. Any request for a personal reply should be accompanied by an SASE.

Second class postage paid at Brasstown, NC, and additional mailing offices

POSTMASTER: Send address changes to Monitoring Times, Post Office Box 98, Brasstown, NC 28902.

LETTERS

Bad Times - Great Radio

"I read with great interest your article concerning disaster planning," says David Pickett of Sharon, Massachusetts.

"Several years ago," David continues, "hurricane Gloria ripped through New England, bringing with it the potential of doing great damage. Not knowing how long we would be without power, or how many batteries I would need, I parked the car where nothing would fall on it and ran 16-gauge zip-cord from the battery into the house.

"That gave me all the power I needed to run my Kenwood R-1000 receiver and a small black-and-white television. Add to that a small kerosene space heater (on which we could also heat food) and we were set for the duration. When the power finally went out, it had no affect on us. I was able to follow all the emergency broadcasts without interruption!"

"You know," concludes David, "major weather disasters aren't bad when you're ready for them."

Bill Carson of Union City, New Jersey, wrote a similar letter. "A neighbor called to let me know that the National Weather Service had declared a severe storm warning for our area. Looking outside, sky was filled with roiling black clouds. It looked serious indeed."

The first thing Bill did was move his car closer to his house so he, too, could tap some of the electricity from his car. "Fighting the wind, I strung cable from the car, across the drive and into the house. I carefully set up the radio, brought in some candles, made sure I had matches, and prepared to settle in.

"In the end, the storm passed without so much as a whimper. The lights didn't even go out. But a large oak tree fell on the car, totalling it. If I had of left it where it was instead of

trying to hook it up to my radios, I wouldn't be taking the bus today."

Pete Kemp is quite a whiz when it comes to AM broadcasting. We've long admired his work with the National Radio Club (P.O. Box 118, Poquonock, CT 06064). His contributions on AM broadcasting are so comprehensive as to be incredible. But there's more to Kemp than AM radio and the NRC. He's also the coordinator for BEARS, the Bethel Educational Amateur Radio Society, a part of the Bethel, Connecticut, Middle School.

The BEARS, it seems, are very excited about the message they received from Soviet Cosmonaut Aleksander Volkov, confirming the club's on-air contact with the orbiting space station MIR last year. You and I know the "message" as a QSL but the kids are excited nonetheless.

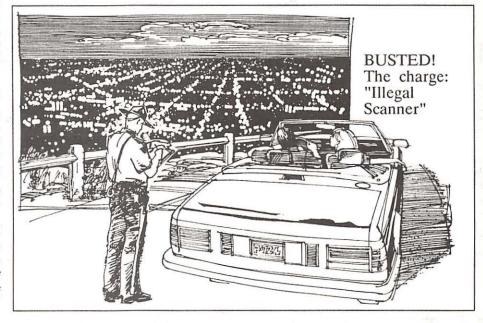
What a great idea. And our thanks to Pete Kemp for getting the word out about radio.

A while back, the papers down in Florida were buzzing about that state's restrictive scanner law. It seems that scanning in private homes is allowed, as is mobile scanning by licensed hams, radio and TV stations, and emergency personnel. Prohibited is the use of scanners in motor vehicles, business establishments and newspaper offices. It's that last one that got reader William Blackstone of Sarasota, Florida, up in arms.

"I worked at the Sarasota Herald Tribune during the 1950s. For 21 years, I was a newsphotographer in Columbus, Ohio. During this time, I always had a scanner in my car. Some of the earlier ones were tunable and without a squelch circuit but all were valuable to my profession.

"I worked closely with law enforcement. They knew of my radio equipment and I never had any problems. Over the years, I've even been able to help the police through my monitoring. Why, then, would the law permit radio and TV news people to have scanners in their cars but not newspaper reporters and photographers? You know, it almost seems that scanners are getting like handguns: only the bad guys will have them."

Please turn to page 100 for more "Letters"



COMMUNICATIONS

New FM Band Goes Kaput

The FCC has reaffirmed its earlier decision to reject the concept of establishing a second FM band. The frequency range, from 50 to 54 MHz, was to be carved out of the amateur radio 6 meter band and reallocated to a new FM broadcast band. Known among supporters as "FM2," the new frequency range was designed to provide a new home for limited time and low-power AM stations and some low-power FM stations.

The FCC, in making their ruling, stated that "the petitioner has not provided a satisfactory demonstration that amateur operations at 50-54 MHz could be accommodated elsewhere in the spectrum or that broadcast operations in this band would not cause interference to international amateur

communications."

The original petition for the establishment of FM2 was filed last year by Lawrence J. Tighe, Jr, owner of 1000 kHz WRNJ-AM and himself a General Class amateur radio operator.

Cuba Braces for TV Marti

Cuba says that it has "taken steps" to prevent the United States from broadcasting television programs to Cuba. Cuban Foreign Minister Isidoro Malmierca, in a letter to U.N. Secretary General, Javier Perez de Cuellar, said that the pretexts used by Washington to set up the TV station are as "childish as they are cynical."

Malmierca also stated that the U.S. economic blockade on Cuba has already prevented his country from buying modern transmission equipment. He did not explain the "steps"

that his nation will take.

According to sources in Washington, TV Marti will use "advanced communications technology," allowing the station to be received in Cuban homes without the need of antennae and will supercede "one or more" television channels in Cuban territory. TV Marti could be on the air by the time you read this. If so, be sure to

listen in on the AM band for examples of Cuban retaliation.

Ham Operator Charged with Piracy

The FCC is at it again. This time, a licensed ham radio operator in West Taghkanic, New York, was fined \$1,000 for illegally broadcasting on the AM broadcast band. The FCC had received a complaint from the New York State Broadcasters Association that an alleged unauthorized station was rebroadcasting U.S. Armed Forces Radio Network programs and "news" from the John Birch Society on 1000 kHz.

The unauthorized station, which an FCC press release says was operated by Frederick Stark, KA2YLZ, apparently interfered with the reception of a licensed station on 1010 kHz.

Long Distance, Please

On Christmas morning, police and fire dispatcher Mark Wilkins was on the job, hoping for a safe and uneventful holiday. Occasionally, his thoughts drifted toward home, 15 miles away in Quincy, Massachusetts. Half a world away, Max Van Arnhem was listening.

With an ear to his four receivers, the Huissen, Netherlands, resident successfully heard Wilkins dispatch an ambulance for a medical emergency at the Norwell Gardens Senior Citizens center.

"At the given time, I heard a male dispatcher after an alert-tone: 'This is KCG933 to all stations to receive us, responding to a medical aid at 399 Washington Street, that is 399 Washington Street, apartment 7A, time of tone 9:46," reads the reception report. The report was accompanied by a cassette recording of Wilkins' voice.

Said Fire Chief George Cavanagh, "It's a small world." Yes, chief. With radio it is.

New Spy Proof Radio Communications

According to Vice Admiral Jerry Tuttle, the Navy's command and control chief, the U.S. Navy is trying to prevent a recurrence of the Walker spy disaster by rapidly deploying a new generation of computerized message scrambling machines.

The scramblers, also known as cryptological machines, translate radio messages into seemingly chaotic lists of numbers -- lists that are theoretically impossible to understand when intercepted. According to Defense Department officials, only friendly forces possessing a secret numerical key and a scrambling machine can translate the messages back into the original message. The secret numerical key is electronically fed into the machines, thus bypassing potential spies.

City Penalized for Not Fixing Radios

A judge placed the financially troubled city of East St. Louis on one year's probation for potentially endangering its police officers. The city was convicted of reckless conduct for not repairing radios in squad cars. It was the city's second conviction in three months and only the third known against a city in Illinois.

According to the State's Attorney for St. Clair County, "The City has made a minor effort to improve the situation" adding that "many officers have bought their own radios." The maximum fine for the conviction is \$1,000.

A Shortwave Revolution

During his U.S. tour last November, Lech Walensa insisted on attending a Washington conference sponsored by Radio Free Europe and Radio Liberty. There he was asked how important the U.S.-funded radio networks had been for the cause of Polish freedom. He replied with a

COMMUNICATIONS

simple question: "Would there be land and earth without a sun?"

For almost 40 years, the "sun" of Radio Free Europe and Radio Liberty has illuminated the darkened lands of Eastern Europe. Western broadcasts were often the only ones people behind the Iron Curtain listened to. Estimates are that the four main Western broadcasters (RFE/RL, Voice of America, the BBC and West Germany's Deutsche Welle) reached 75 million listeners a week in the Soviet Union alone.

Throughout Eastern Europe. foreign broadcasts were always trusted more than the domestic media. When East Germany's Communist regime announced that it was opening the Berlin Wall, hardly anyone tried to cross over. But they moved hours later when East Berliners heard a Radio Free Europeaffiliated station report that a couple had crossed over.

But nowhere was the impact of Radio Free Europe greater than in Romania. The Orwellian nature of the Romanian media meant that an estimated 88% of the adult population listened to international radio. "Everyone I know learned about the changes in Eastern Europe from radio," university student Juliana Petrescu told us. "It gave them courage."

The good that U.S. broadcasts can do for oppressed peoples isn't over by any means. Radio Free Europe can now play an important new role in the countries of Eastern Europe that are throwing off communism: It can help them understand the more routine details of political and economic freedom. A growing number of listeners are asking for information on the practical aspects of building democratic institutions, creating a free press, and nurturing a free economy.

The \$200 million a year or so that the U.S. spends on them to broadcast news and culture in 22 languages is surely one of the most productive Cold War investments it ever made. It is an investment that should continue so long as the peoples of the Soviet Union and Eastern Europe are

Radio Free Europe, a source of information and hope for so many years. may soon be able to say, "Mission

still striving for full national sovereignty and human rights.

accomplished."

-- The Wall Street Journal

Radio Free Europe Happily Prepares to Sign Off.

Radio Free Europe's success at nurturing freedom in Eastern Europe could put the broadcasting service off the air, according to publishing Forbes. executive Malcolm Forbes was just reappointed by President Bush to head the Board for International Broadcasting, the parent organization of RFE.

"If in the coming years," said Forbes, "certain conditions are met, we can say with pride, 'Mission accomplished. You don't need us anymore." Forbes added that in some nations, such as Hungary, Poland and Czechoslovakia, Radio Free Europe's job could be completed in one to five

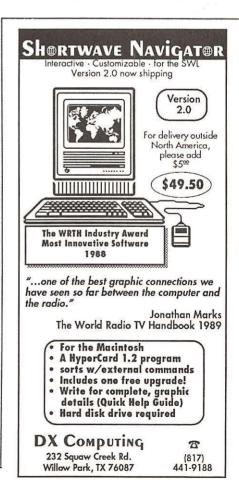
But Forbes said that the most important work is still to come for Radio Liberty, a similar service broadcasting to the Soviet Union.

"In the Soviet Union, you have numerous nationalities; you have a significant portion of the population wanting greater elbow room; you have an economy that's much worse than in Eastern Europe," he said. "The Soviet Union is in for some very rough sledding."

Munich-based Radio Free Europe and Radio Liberty serve as "surrogate" radio stations for the 11 nations tuned in, Forbes said. "They play what you'd have in each country if it were 'free.'"

-- The Star Ledger

Thanks to Dave Alpert, New York, New York; Rene Bordo, Sunnyvale, California: Torkel Clark, Chico, California; Bob DiCorcia, Franklin Park, Tom Dotset, Washington, D.C.; New Jersey; Dick Keough, Braintree, Massachussett; Pat Lacey, Phoenix, Arizona; Thomas McKeon, Indianapolis, Indiana; Michael Prosise, Daisy, Maryland; Zack Schindler, Ferndale, Michigan; Justin St. James; Indiana, Pennsylvania; Robert Turner, Yonkers, New York.



THE MOUSE THAT ROARED

by Karl J. Zuk

The AM broadcast band is expanding to 1700 kHz, and you can transmit on it, legally, without a license! Your signals may be heard hundreds of miles away, and it will cost you less than a hundred dollars to get on the air.

If it sounds too good to be true, it's not! Dozens of people in North America are already doing it, and you can join in the fun today!

Become a MedFER Operator

Recently, the Federal Communications Commission updated their rules and regulations allowing the MedFERs (Medium Frequency Experimental Radio Stations) to operate from 510 to 1705 kHz. For the first time, experimenters can transmit in the nearly unused 1610 to 1705 kHz band where, almost nightly, signals can be heard from amazing distances. Until the FCC begins to authorize commercial broadcasters on these frequencies, it is a DX paradise that awaits your visit!

Play by the Rules

The FCC has given you an inch. You have to learn how to make it go miles and miles! The rules are pretty simple: The power input to your final tube or transistor cannot exceed 100 milliwatts. That's only one tenth of one watt.

Almost any type of modulation is allowed: CW, RTTY, AM, FM, single sideband, frequency shift keying, and even TV. The only prohibited type is Class B, known as "damped waves."

In the 1610 to 1705 kHz range, your station's field strength should be no more than 14 microvolts per meter at a distance

Your antenna can be no longer than

three meters (about ten feet), which

includes the antenna, the transmission

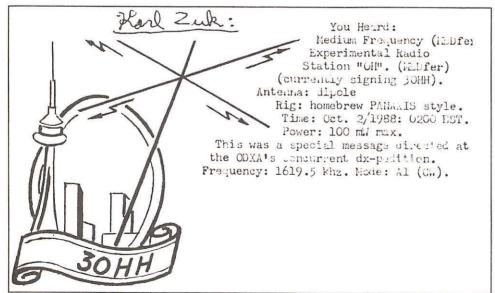
line, and any ground lead, if you use one.

station's field strength should be no more than 14 microvolts per meter at a distance of 30 meters. If your transmitter and antenna meet FCC specifications exceeding this limit is almost impossible.

Finally, a label must be affixed to your rig which reads: "This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) his device must accept any interference received, including interference that may cause undesired operation."

If you construct your own transmitter, add these three sentences: "I have constructed this device for my own use. I have tested it and certify that it complies to applicable regulations of FCC Rules Part 15. A copy of my measurements is in my possession and is available for inspection."

Then, sign and date the form, and post it on the transmitter. In Canada, you get an extra bonus: there are no restrictions on antenna length.



How far can you transmit on a tenth of a watt? Well, here's the challenge. 30HH's signal reached me from 500 miles away! Beat that if you can...

Other frequencies are also available for your experimentation. 160 to 190 kHz is a popular band for unlicensed beacons. Operating on long wave, these are known as LowFERS. Here, the FCC allows one watt input to your finals and an antenna height of 15 meters. These stations also may travel hundreds of miles.

A newly allocated band for unlicensed operation is 13.553 to 13.567 MHz. Your field strength can be 10,000 microvolts at 30 meters, which is roughly the same power as un unlicensed Citizen's Band walkie talkie. Part 15 transmitters can also be operated on the FM broadcast band, but their reception distance is very limited.

For complete details on the new Part 15, order FCC Docket 87-389 by calling 202-857-3800, or go to a local library that serves as a depository for federal documents and review it. Now you know the basic rules. Let's learn some expert strategy.

The Mighty Flea

MedFERs may be flea-powered, but their signals are mighty. Ask Ken Cornell, operator of station KEN in Point Pleasant Beach, New Jersey. Like most MedFER operators, Ken uses Morse Code to send his callsign over and over again, much like long wave navigational beacons. CW is the preferred mode, since it can be received about ten times easier under weak signal conditions.

Repeating your callsign constantly makes your station very easy to identify. KEN is on the air nightly on 1652 kHz from 0200 to 0400 UTC, and has been heard in Ontario and Ohio. Herb Balfour of Richmond Hill, Ontario, is quite proud of his MedFER 3OHH. DXers have heard it all over the East Coast, and Herb even received a tentative logging from Norway! Arizonans Greg Farkas (AZ on 1689 kHz) and Rex Wilson (TI on 1650 kHz) have both been heard in Hawaii.

Imagine the feeling of accomplishment and pride these guys must feel! Hundreds of miles on a hundred milliwats!

There is a lot of skill involved in this hobby. Ken Cornell gives this advice: "Don't expect to set the world on fire with your first attempts at communications on this band. It takes time and patience to



Old carrier transmitters are easily adapted for MedFER use.



MedFER station Y-12 uses an antenna with a capacitive "high hat" to improve antenna efficiency.

familiarize yourself with your equipment and band conditions. You have to learn to milk the last milliwatt out of your transmitter and antenna as well as improving your receiving techniques."

Ken is the author of *The Low and Medium Wave Radio Scrap Book*, considered the Bible of MedFER operators. It's loaded with easy to build projects that will educate you in every aspect of receiver and transmitter design and operation. His book describes how to improve your receiver's sensitivity, null out noise with specialized receiving antenna designs, and increase your transmitter and antenna efficiency dramatically.

The Final Product

The basic MedFER station begins with a tiny transmitter using just a handful of parts. Another small device will key the transmitter to produce your CW callsign. This can be done with a simple circuit or mechanically.

New York station Y-12 uses a surplus device that came from an old fishing vessel's beacon transmitter. A wheel, with small metal notches, spins slowly as a



Y-12 uses a CW identifier that came from a Japanese fishing vessel.

microswitch rides on its edge. As the wheel travels around and around, the microswitch turns on and off creating a CW callsign. Other versions have been constructed from old clock motors with a notched wheel of masonite and a microswitch to create the same effect.

FCC rules prevent the antenna and feedline from being longer than ten feet, so no one uses a feedline. The antenna is attached directly to the transmitter, and it all stays outdoors. A pair of wires to a

DC power supply is usually all that is connected to your house. Loading coils can be used at the base of the antenna, to increase its electrical length, but they must be enclosed in a shielded chassis to conform with FCC regulations.

The antenna element can be a simple as a whip antenna or a TV antenna mast. Some operators prefer to use a capacitive "high hat" to improve antenna efficiency. One MedFER, Ron Barlow of Cleveland, North Carolina, uses a directional vertical loop antenna for his station, "A" on 1631 kHz.

If you use PVC pipe in the construction of your loading coil or antenna, be sure to only use white pipe. Other colors conduct electricity slightly and will ruin your project!

Keep your antenna from shorting to ground with a glass insulator. A pop bottle works just fine! Remember that time and moisture are your worst enemies. Household silicon seal is a good investment to keep your outdoor transmitter box safe from water damage. Make sure it's almost air tight!

Also remember that an efficient antenna system requires a good ground. The best ground system consists of many long pieces of wire buried in soil meeting at the base of your antenna resembling the spokes of a wheel. If you don't want to dig up your property, large pieces of chicken wire fence can be laid over your grass and soldered together surrounding the antenna base. Your town's cold water pipe system may suffice, but NEVER use a gas pipe! The results could be explosive!

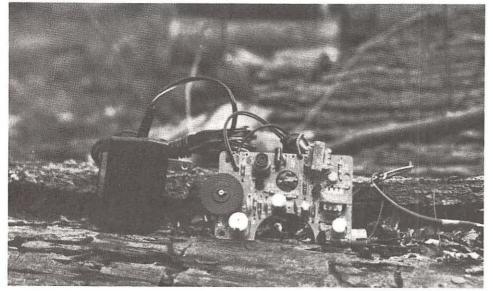
Almost all transmitters are home-brew, but use your imagination! Easy plans are available from several sources, and deluxe kits, complete with parts and chassis, are available, too. Panaxis Productions of Paradise, California, sells a handsome transmitter kit complete with box and power supply for \$87.95.

Old type cordless phones operated just above the AM broadcast band, and are right on frequency to become MedFER transmitters in minutes. Station Y-12 uses a printed circuit board from an old wireless babysitter designed for the AM band. Transmitters like these are very easy to construct and well within the reach of beginners.

Tell Me More!

You can listen to established station operators trade tips every Sunday on the LowFER Net; heard on amateur radio. Join in the conversation, if you are a licensed ham. On the East Coast, try 1983 kHz on Sunday nights around 9 pm EST. On the West Coast, tune in at 7:30 am PST Sunday mornings on 3927 kHz. Both nets operate on single sideband. They'll be glad to welcome you and help you along in your new hobby.

Several newsletters are available that include MedFERS and their operation. For the latest news, listings of active operators, and circuit designs, subscribe to Herb Balfour's *The Northern Observer* (91 Elgin Mills Road West, Richmond Hill, Ontario, L4C 4M1, Canada). Herb collects information and news of advancements and achievements from other low-powered transmitter operators and culls them into a fascinating home-brew magazine.



Y-12's transmitter used to be an AM radio baby monitor.

A Sample of Active MedFER Beacons

Frequency	Callsign	Location
525	Т	Sunnyvale, CA
1620	30HH	Richmond Hill, ON
1620	U	Salt Lake City, UT
1631	Α	Cleveland, NC
1634	YOR	Ravenna, OH
1637	RR	San Rafael, CA
1640	DAW	Greer, SC
1648	ABC	Hilton Head Is, SVC
1650	G4	Palo Alto, CA
1650	TI	Kingman, AZ
1652	KEN	Pt Pleasant Beach, NJ
1655	CO	Glenwood Springs, CO
1661	U	San Diego, CA
1687	D	Descanso, CA
1688	TUS	Tucson, AZ
1689	AZ	Tucson, AZ

The Longwave Club of America publishes a monthly bulletin, *The Lowdown*, all about unlicensed beacon operations and reception techniques on long and medium wave. Write to: Bill Oliver, 45 Wildflower Road, Levittown, PA 19057.

The International Radio Club of America is a medium wave only club that publishes *DX Monitor* 34 times a year, and has a wealth of information to offer from their "Goodie Factory." For details write to: IRCA, 6059 Essex Street, Riverside, CA 92504-1599.

Everyone should have a copy of Ken Cornell's *The Low and Medium Frequency Scrap Book*, an excellent primer for beginner and seasoned DXer. It's \$16.95 from Ken at 225 Baltimore Avenue, Point Pleasant Beach, NJ 08742.

Another source for all kinds of discount supplies and a notebook describing numerous useful circuits and hints for low powered operators is Oak Hills Research, P.O. Box 250, Luther, MI 49656. An SASE will get you their list.

Panaxis Productions, P.O. Box 130, Paradise, CA 95967-0130 distributes a comprehensive catalog of transmitter and antenna kits, do-it-yourself books, and radio accessories for MedFER use. They produce a complete, easy to assemble MedFER transmitter kit, too.

It's easy to become an expert DXer who can make the best of receivers and transmitters. Learn the easy way by experimenting with your own equipment. Become a MedFER!

mt

Credits

Thanks to John Reed and Kevin McKeon of the Federal Communications Commission, MedFERs Ken Cornell, Herb Balfour, and Steve McGreevy, Doug DeMaw of Oak Hills Research, and Ernie Wilson of Panaxis Productions.

CHANNEL CLEANER™

- · New reception principle.
- · Reduce Interference 15-30 dB.
- · For small portable radios.

Bugged by interference? Two stations on one frequency and you can't understand either one? Splatter? Heterodynes?

Channel Cleaner™ solves these problems. Simply place your radio on Channel Cleaner's platform. Tune Channel Cleaner™ and rotate it to null out the interference.
Channel Cleaner™ makes

Channel Cleaner Makes a directional radio frequency shadow that shades your radio's antenna from the interference. Reception in all other directions is normal.

Experience this exciting new development. Order your Channel Cleaner™ today.



Model PA-420 Channel Cleaner™ \$79.95 + \$4 shipping/handling in U.S. & Canada. California residents add sales tax.





CONFIDENTIAL

requency

List

Send for FREE catalog that shows our complete line of antennas, preamplifiers, and filters.

PALOMAR Engineers

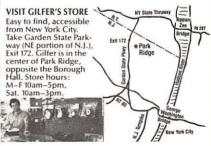
BOX 455, ESCONDIDO, CA 92025 Phone: (619) 747-3343

GILFER first in Shortwave

GILFER'S FAMOUS "CONFIDENTIAL FREQUENCY LIST" \$19.95

Popular Communications magazine says: "Can't imagine anyone attempting to listen to HF voice or CW/RTTY communications."

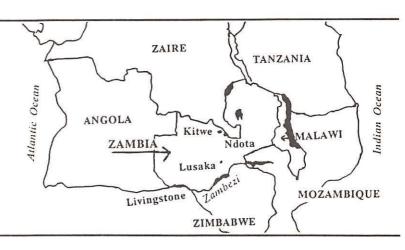




GILFER SHORTWAVE 52 Park Ave, Park Ridge, NJ 07656, Ph 201/391-7887

ZAMBIA on Shortwave

by Colin Miller



Formerly known as Northern Rhodesia, Zambia is located in southern central Africa. It's a landlocked country bounded by Zaire on the north, Tanzania, Malawi, and Mozambique on the east, Zimbabwe on the south, and Angola and Southwest Africa/Namibia on the west and southwest.

To get an idea of Zambia's size, think of Texas -- with an area of 290,586 square

miles, it is somewhat larger. To get an idea of some of Zambia's problems, imagine that a Texas where the people speak over 70 languages in addition to English.

The history of Zambia goes back to the early nineteenth century when various Portuguese explorers traversed the country between Angola and Mozambique. In 1850, Dr. David Livingstone reached the

Zambezi River from the south; and in 1855 he discovered the Victoria Falls on his famous missionary journey.

(It is worth mentioning here that Victoria Falls greatly surpasses Niagara in dimensions. The width of the falls is one mile, with a maximum height of 420 feet. Although of greater volume, Niagara has parallel drops of only 158 and 167 feet.)



Thomas Larson/Nat'l Geo Soc

Imagine a country the size of Texas, containing more than 70 different languages and cultures adapted to modern society to varying degrees, and you'll get an idea of the diversity faced by African nations today.

Radio Comes to the Zambezi

It was not until World War II that Northern Rhodesia acquired a radio service. In 1941 the government's Information Department installed a 300 watt transmitter in Lusaka, the capital. This station was built for the purpose of disseminating war-related information.

From the outset, the Lusaka station addressed programs to Africans in their own languages, becoming the pioneer in the field of local vernacular broadcasting. In 1945 Harry Franklin, Lusaka's farsighted information officer, proposed that Radio Lusaka concentrate on developing programming for Africans.

Since Northern Rhodesia could not afford such a specialized service on its own, the administrations of Southern Rhodesia and Nyasaland were persuaded to share in the operating costs, while the British Government agreed to provide capital funds. Thus, the Central African Broadcasting Station came into being.

Among the by-products of this effort were the world's most extensive collection of ethnic African music, and a breakthrough in that most formidable barrier to audience growth, the lack of a receiver which Africans could afford to buy.

Radio in a Saucepan

Franklin tried for three years in the late 1940s to persuade British manufacturers that a potential mass market existed among Africans for a very simple and inexpensive battery-operated shortwave receiver. (One must bear in mind that this was before the days of transistors.) He finally persuaded a battery company to invest in the research and development of the idea.

One of the early models was mounted experimentally in a nine inch diameter aluminum housing originally intended as a saucepan. Thus was born in 1949 the famous "Saucepan Special," a four-tube tropicalized shortwave receiver, which succeeded even beyond Franklin's expectations. It cost five pounds Sterling, and the battery, which lasted 300 hours, was an additional one pound five shillings.

Within the first three months, 1,500 of the Saucepan Specials had been sold, and in the next few years, 50,000 sets were imported. Franklin had hopes of capitalizing on a world market for the sets, but within a few years the transistor came into mass production and so turned his brainchild into a mere historical curiosity.

In 1953 federation came, and in 1958 a new broadcasting organization, the Federal Broadcasting Corporation of Rhodesia and Nyasaland, was founded, with headquarters in Salisbury, Southern Rhodesia (now Harare, Zimbabwe). Lusaka continued to use African languages as well as English, but the spirit which had animated the original station had long since been drowned by the rising tide of animosity between the races.

Eventually, in 1964, Northern Rhodesia and Nyasaland broke away from the federation and became Zambia and Malawi. The station in Lusaka was then known as the Zambia Broadcasting Corporation until 1966, when it changed to Zambia Broadcasting Services (ZBS). This was again changed at the end of 1988 to the Zambia National Broadcasting Corporation (ZNBC). The ZNBC is a government department under the Ministry of Information, Broadcasting and Tourism.

There are two domestic services: the General Service with over eight AM



Benjie Thomas

Radios are easily available in today's Africa, but it wasn't always so. Harry Franklin foresaw the impact of radio could have in the political life of Africa -- he just didn't foresee the development of transistors!

stations, broadcasting in English, Bemba, and Nyanja; and the Home Service carried by ten AM stations, using the seven major languages of Bemba, Nyanja, Lozi, Tonga, Kaounde, Lunda, and Luvale. These are used in rotation to ensure a prime time audience for each group.

Programs include news, public affairs, light entertainment, sport, religion, and education. School broadcasts are carried on the General Service during school semesters. Agricultural programs for farmers cover all the country areas. Listening is encouraged by free provision of receivers for farm radio forums, of which there are more than 600. An annual license fee is payable, but many receivers are not licensed.

The latest available shortwave schedule is as follows: General Service 6165 kHz all times; and 7235 kHz 0600-1530. The Home Service uses 3290 and 4910 kHz, 0255-0600 and 0255-0730 respectively, and 1530-2105 (Sat/Sun 2205); and 7220 kHz 0600-1430.

Transmitters range in power from 10 to 50 kW. The best times to hear these

stations in North America are around signon and sign-off.

In addition to the above, the ZNBC has an External Service called Radio Zambia International, beamed to Southern Africa over a 50 kW transmitter. The schedule is from 1555-2105 (2205 Friday and Saturday) on 9505 kHz in English and various African languages. It has also been carried on 9580 kHz as an alternative channel. Much of the programming is anti-apartheid material produced by nationalist political groups.

On Sunday mornings UTC there is sometimes an additional transmission commencing at 0555 UTC but this is on an irregular basis. Frequencies include 9505, 11880, or 17895 kHz.

The station interval signal is the distinctive call of the fish eagle, a striking reddish-brown, black winged bird with white head and breast, found throughout southern Africa. Its wild scream thrills all who hear it. Judge for yourself.





Old Radios Never Die



by Everett L. Slosman

r ver wonder what happened to that Hallicrafter or National you used for your first DX attempts? Or what about the cathedral cabinet radio which sat on the folk's living room table, and is now being instant-copied in plastic by offshore companies for the consumer knockoff market?

Readers know there are "buffs" who rebuild and restore old radios from cat whisker receivers to novelty cases. What they may not realize is that these collectors are as dedicated to their portion of the radio hobby as any DXer trying to log a 10 watt domestic station half way around the world.

The Antique Wireless Association and Antique Radio Club of America cater to restorers and collectors. However, because their members have herd instincts, local and regional organizations also exist to fulfill "rag-chewing" and "tech-bragging" needs.

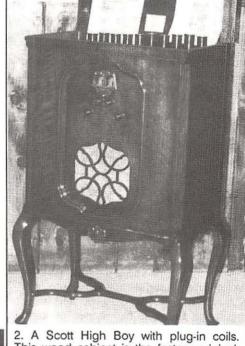
One of the larger groups is the New England Antique Radio Club (NEARC) with over 300 members throughout the United States, Canada, Puerto Rico, and the Virgin Islands.

They publish a quarterly newsletter, The Escutheon. It is 20 pages of club news, article reprints, restoration tips, and strong

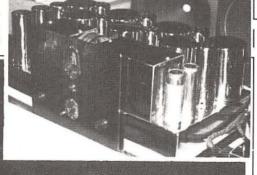
opinions. It reads like the old Newark News DX bulletin, complete with territorial imperatives, calls for more this or that, and lots of chest-thumping. The publication is definitely not dull.

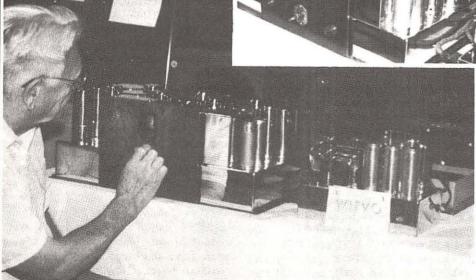
Every three months NEARC holds a swap meet in Nashua, New Hampshire, inside a church building aptly named the Resurrection Center. Here, between 30 and 40 dealers operate sale booths while other members display their restored receivers and unusual items hoping to win a ribbon. Competition is fierce, but friendly, and the radios are superb examples of their class.

"Buffs" are not the only ones prowling the aisles. There are a number of "yuppies," "dinks," and decorators crowding tables searching for restored Grebes and Majestics to serve as decor in 200 year old remodeled New England farmhouses. They may not know a TRF from a superhet or a transistor from an octal, but they love veneers, mahogany, and grille cloth and can spot a bargain from halfway across the room.



This wood cabinet is the factory original.





1. Aime Baudry in front of his Scott All Wave receiver. The speakers are mounted in homemade baffles and the cabinet face is also homemade. The power supply is separate.

His Father's Scott (Photo 1)

E.H. Scott Radio Laboratories advertised their 12 tube All Wave component kit as the "only receiver guaranteed to give daily world-wide reception." This was no idle boast. The Chicago, Illinois, firm's superhetrodynes held all the verified regular reception records during most of the 1920s. That may be the reason Aime Beaudry's father bought one for his Manchester, New Hampshire, home.

This All Wave contains a preselector RF stage, oscillator and detector, IF amplifier, second detector, and an audio filter with state-of-the-twenties fidelity. It uses separate coils for each band that mount in a mechanical selector under the chassis. This system differs radically from the tapped and plug-in coils in use at that time. Even today, this unit delivers exceptional performance.

Aime Beaudry, W1FVQ, commercial broadcast pioneer, and avid Monitoring Times reader, is a fixture at these swap meets. He represents the first generation of New Englanders who grew up with radio: crystal sets, Allied Radio do-ityourself receiver kits, and N.R.I. correspondence courses.

Rag-chewing with this broadcast engineer and Civil Air Patrol officer means hearing about old radios and the pioneers who commercialized Marconi's inventions. He talks passionately about the early days, before television, and has preserved everything he can about this one set, from the original purchase invoice to outboard speakers.

It was not, interestingly enough, the All Wave, but Scott's floor model version, the High Boy (Photo 2), that was considered the ultimate living room radio. More furniture than technology, it bridged a gap between housewife and hobbyist, placing radio in middle-class parlors.



 This Grebe cathedral style radio is typical of the units produced in the early 1930s and is very much in demand as a decorator item.

Grebe Cathedrals (Photo 3)

Another prize restoration is the 1931-32 Grebe cathedral style "Syncrophase" with a mahogany and burled walnut case. This AC table radio was among the last units manufactured on Long Island by A.G. Grebe & Co., Inc., before the company went bankrupt.

Like many other early manufacturers, Alfred H. Grebe was up to his loose couplers in radio before he hit his teens. He shipped out as a 17-year-old wireless operator in 1912; four years later he began manufacturing and selling regenerative receivers.

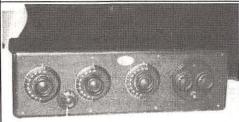
World War I shut down the fledgling broadcasting industry and Grebe was reduced to installing Navy subchaser radios. After the war, he went back to manufacturing consumer radios. This activity earned him the distinction of being

the first person sued for patent infringement by RCA.

Rapid technical advances prompted Westinghouse, Armstrong, RCA, and Hazeltine to slug it out in the courts for control of the key patents involved in the hot consumer radio market. Many small entrepreneurs found themselves embroiled in costly legal battles over patent rights. But, that's a story for another day.

Grebe operated radio station WAHG as a way to advertise receivers. The station was later sold to Atlantic Broadcast Company and re-signed WABC. Eventually, they sold the station to Columbia Broadcasting Corporation who changed the call letters to WCBS.

The Great Depression forced Grebe to shut down in 1932 and reorganize. He intended to resume manufacturing, but died in 1935 of complications following a colostomy. The Grebe cathedrals passed from the retail scene and into the collector's world.



4. An early Atwater Kent model. At the time, this was one of the more popular models. It required headphones and the tuning scales used linear marking from 0-100 instead of frequencies and bands.

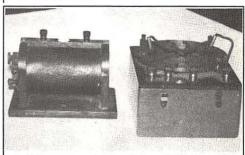
Atwater Kent (Photo 4)

Atwater Kent invented a distributor and ignition system used in most automobiles until it was replaced by the electronic ignition. Few realize, however, that this Worcester Polytechnic Institute engineering dropout also manufactured everything from electric meters to optical gun sights.

He also built coupled-circuit regenerative and RF tuners. The popular Atwater Kent radio line included a variety of models from one-dial table units to full-floor consoles. Success came as much from Kent's marketing sense as from his engineering skills.

But, like others, he misread the economic warning signs and became mired in the depression. He worked hard to stay afloat, but by 1936 the thrill of technology

faded. The company closed and he retired. Kent spent the next decade in Hollywood mixing with movie stars and celebrities, as happy in retirement as he had been as a Worcester Polytech's college bad boy and all-around campus rake. He died in 1949.



5. Military spark gap (L) and Air Corp inplane transmitters, circa 1918.

Early Military Gear (Photo 5)

These two units date back to the U.S. Army's early broadcast experiments. The one on the right is a transmitter used in WW I observation planes. The spark circuit relied on the flat wound coil rather than a more conventional cylindrical type. While pilots dodged groundfire and enemy planes, observers keyed messages in Morse. It was crude, but effective, and beat dropping notes to the ground in weighted scarfs.

The other unit is a military spark coil, part of the original technology made obsolete by later refinements in Fleming's valve and Armstrong's tubes.

National (Photo 6)

National's receivers competed with Hallicrafter and others for the ham and shortwave markets following World War II. Most units, like this SW-5 (on top), came in metal cases that made them more suitable for the shack than the living room.

Early kit units used the regenformer circuit which was also the heart of the Browning-Drake receivers. Both companies used National's condensers and vernier dials. In 1925 Browning-Drake began producing complete receivers while National stuck with their kits. Eventually, the firms went their separate ways, evolving into Browning Laboratories, Aircraft Radio Corporation, and National Company.

Eventually, National dropped out of the hobby market and concentrated on the industrial communications sector. The shortwave receivers still pop up in garage and estate sales where they are ignored by



6. National SW-5 (top) and E.R.L. Sentinel Model AC radios.

DXers. They are reasonably priced and ideal starters for the beginning collector.

E.R.L. Industries (Photo 6)

On the other hand, the E.R.L. on the bottom of the photo has a different image. In the early 20s, the company produced quality consumer receivers for the home in both table and floor models.

George A. Pearson, an automobile dealer and dabbler in technology, founded E.R.L. in 1921 as a part-time venture. The firm suddenly went from producing reflex circuit kits in Chicago to building half-amillion cabinet units in 1925. But, like other technology firms, they continued to lose money.

By 1928, Pearson wanted out and sold the company to Greene-Brown, a Chicago firm that manufactured B-battery eliminators. Unfortunately, the two plants were at opposite ends of Chicago. This lead to production inefficiencies and in 1930 to bankruptcy.

Reorganized the next year as the Sentinel Radio Corporation, they built their own Sentinels and private labels for the chain store and export markets. Magnavox absorbed them in 1956.

Zenith Trans-Oceanics (Photo 7)

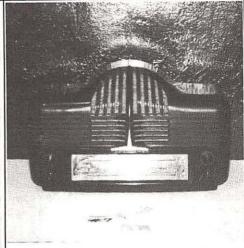
For some, nothing can replace Zenith Trans-Oceanics, the world's first true portable multi-band receiver. Patterned after an experimental model used on polar expeditions, the first commercial model rolled out in mid-1941 and was snapped up by GIs on overseas assignments.

The Zenith mystique continued after

WW II, making it the most popular portable on the civilian market. During the Korean War, it became a best seller in Post Exchanges and Ship's Stores in Korea and Japan. Some specialists collect one of each model from the loctal tube 8G005 to the fully transistorized R1000D.

If you are looking for excitement, casually mention you have a 1946 Clipper or a 1952 G500. Trans-Oceanic collectors jump on such statements like a dog on a meaty bone.

Ask a question about a particular model and they will spend hours bending your ear while talking about their own units. Some still use their Zeniths to DX and can pull in an amazing variety of stations. Naturally, there is a lot of one-



8. This art deco designed Sonora earned a third place in NEARC's recent 1930s AC Set competition.

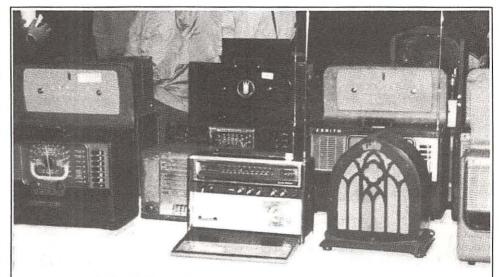
upsmanship involved, but they have the QSLs to prove their abilities.

Sonora (Photo 8)

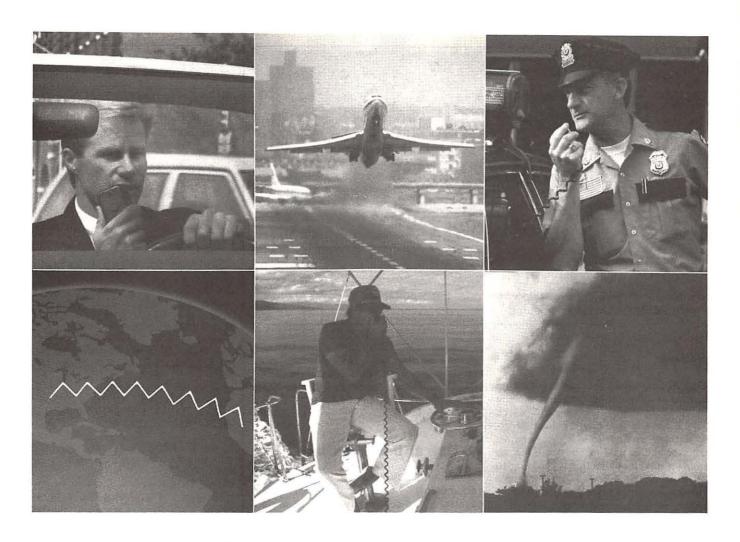
American Bosch Magneto originally built the Sonora radio line which was taken over by Arborphone in 1927. The new company began manufacturing several table models. The bakelite-cased Sonora Excellence 301A is one of the company's last art deco models.

Very little is known about the company's founders or their engineers. Arborphone was not an innovative manufacturer, but they produced a medium priced unit which sold well and looked nice. So, the Sonora line survived into the mid-1950s.

(cont'd p.16)



7. A gaggle of Zenith Trans-Oceanics; some with Wavemagnet antennas. These could be removed and placed in a window or other remote location for better reception.



Realistic®-The First Name In Communications

Quality Electronics At Low Prices, at the Radio Shack Near You

Your nearby Radio Shack offers a big selection of exclusive Realistic equipment, including our 10-meter mobile Ham transceiver,

marine VHF two-way radio, shortwave receivers, CBs, scanners and easy-to-use Weatheradio® receivers.



Backed by Service

Radio Shack supports every Realistic product with friendly people and personal service at 7000 locations.

Discover the big advantages of choosing America's first name in communications—Realistic service, selection and quality! FREE 184-Page Catalog! Write: Radio Shack, Dept. 178-19, 300 One Tandy Center, Fort Worth, TX 76102

REALISTIC Exclusively at

Radio Shack The Technology Store



Swap Meets will find you everything from multi-band portables, to novelty radios, to embroidered speaker enclosures.

Novelties

One of the most fascinating collecting categories involves novelty radios like the radio globe by Vista or the giant watch radio. A novelty buff might collect advertising, Disney, or Charlie McCarthy radios. There are all sorts of possibilities to assemble a novelty collection, according to Harry Poster.

Harry is an authority on novelty radios, a supplier of vintage radios and television sets for advertising and commercial films, and managing editor of Sight-Sound-Style, the quarterly newsletter for serious collectors. He and his wife Anna spend several weekends a year displaying their collection at shows and swaps throughout the northeast.



An early code tape reader. The paper tape had punched holes which activated a key. The principle is similar to a player piano roll. Circa 1910.

Anna and Harry are down-to-earth people who set an informal booth using cardboard boxes to display their treasures. Their collection runs the gamut from Snoopy and his dog house to a Lufkin ruler-radio.

A Day at the Swap Meet

NEARC's Swap Meet is a mixture of equipment, literature, "Nipper" (His Master's Voice) statuettes, remanufactured tubes, the odd, the unusual, and the simply fascinating. There's coffee and hamburgers for the hungry and pleasant conversations.

It's the place for old receivers to end up, not to die on a scrap heap or be cannibalized for parts, but to regain some of their former elegance and dignity. And for radio article writers, it's a place to let your hair down and find a hundred different stories.

I would like to thank Sue and Marty Bunis of NEARC. Without their cooperation, this article would have remained in my word processor.



Suggested Books to Read

Radio Manufacturers of the 1920s, Volumes I and II, Alan Douglas.

Radios: The Golden Age, Philip Collins, Chronicle Books, San Francisco, CA 1987.

Guide To Old Time Radios, David and Betty Johnson, \$16.95 + 1.55 bookrate from DX Radio Supply, Box 360, Wagontown, PA 19376.

The Zenith Story: A History from 1919. The Zenith Radio Corporation.

Sources for More Information

Clubs

Antique Radio Club of America (ARCA), 81 Steeplechase Road, Devon, PA 19333. 215-688-2976.

Antique Wireless Association (AWA), Main Street, Holcomb, NY 14469. 716-657-7489

New England Antique Radio Club (NEARC), P.O. Box 809, Contoocook, NH 03229. 603-746-6127.

For the addresses of other regional clubs, call your local library's reference room.

Museums

Museum of Broadcast Communications, 800 S. Wells Street, Chicago, IL 60607. 312-987-1500.

Museum of Broadcasting, 1 East 53rd Street, New York, NY 10022. 212-752-4690.

Smithsonian Institution, Museum of History and Technology, Washington, DC 20560.

Other publications

mt

Sight-Sound-Style, P.O. Box 1883, South Hackensack, NJ 07606.

All photos are by Everett Slosman



Antique Radio's Largest Monthly Magazine
Articles - Classifleds - Ads for Parts & Services.
Also: Early TV, Ham Equip., Books, Telegraph,
Art Deco, 40's & 50's Radios & more...
Free 20-word ad each month. Don't miss out!
6-Month: \$11. 1-Year: \$20 (\$30 by 1st Class)

A.R.C., P.O. Box 802-P5, Carlisle, MA 01741

GET THE LATEST ADVANCES IN ELECTRONICS

WITH A SUBSCRIPTION TO



ENJOY THE WORLD OF ELECTRONICS EACH MONTH!

Now you can subscribe to the best electronics magazine. The only one that brings you articles on-electronics projects, technology, circuit design, communications, new products and much more.

Radio-Electronics looks to the future and shows you what new video, audio and computer products are on the horizon. What's more you'll find helpful, monthly departments such as Video News, Equipment Reports, Hardware Hacker, Audio Update, Drawing Board, Communications Corner. All designed to give you instruction, tips, and fun.

Radio-Electronics gives you exciting articles like:

- ☐ ISDN: The Telephone Network of Tomorrow ☐ The Facts on FAX
- A Digital Phone Lock
- ☐ How To Design Switching Circuits

PLUS: COMPUTER DIGEST! A New Kind of Magazine for Electronics Professionals.

- EIA-232 A real standard for serial interfacing?
- ☐ Build a synergy card for your PC☐ '386 Power at a '286 price
- Build a biofeedback monitor
- → More on Multiplexing



FOR FASTER SERVICE CALL TODAY 1-800-999-7139

DON'T DELAY SUBSCRIBE TODAY!

Just fill out the order card in this magazine and mail it in today.

Wildlife Tracking in the Everglades

by Robert Wyman

Wildlife Management by Radio

Wildlife management is a science and profession in South Florida, where a variety of environmentally-sensitive species exist in proximity to one of the fastest-growing urban areas of the country. Everglades National Park, which encompasses most of the southern tip of Florida, and the Big Cypress National Preserve in southwest Florida and Biscayne National Park along the southeast coast, provide scientists with a living laboratory of wildlife and habitats which may be studied.

In South Florida, government and private resources have been teamed to accomplish the wildlife-monitoring tasks. Jim Wyatt, owner and operator of James Wyatt Enterprises, Inc., is a private contractor to the U.S. Department of Interior/National Parks Service (NPS).

Mr. Wyatt operates four aircraft out of Homestead General Airport, located about 25 miles southwest of Miami.

Mr. Wyatt's staff includes ten pilots who fly Cessna 172 and Cessna 182 aircraft on a variety of wildlife and environment-related missions. Along with other contractors/pilots, these missions include flights supporting NPS, the Audubon Society, the South Florida Water Management District, and the University of Florida.

Mission profiles include fire surveillance, fire-fighting management and control, bird migration surveillance, bird population studies, coastal waterway management studies, and regularlyscheduled flights to track specific species.

The scheduled wildlife-tracking flights are used to monitor the health and migratory patterns of selected birds,

panthers, deer, manatees, and turtles. Radio transmitters have been used for several years to aid in this effort.

Panther Tracking Mission:

Background

One daily flight monitors the location of several Florida panthers, an endangered species with only 30 to 50 animals estimated to remain in existence. Approximately 25 panthers are estimated to live south of Lake Okeechobee, with under ten of these living within the confines of protected federal property. Several panthers are fitted with radio transmitter collars as part of this study.

Personnel and Equipment

A typical daily flight includes pilot Terry Buker, a member of Wyatt's staff under contract to NPS, and Sonny Bass, an NPS Research Biologist who was raised in the Homestead, Florida, area and has served NPS and Everglades National Park for 14 years.

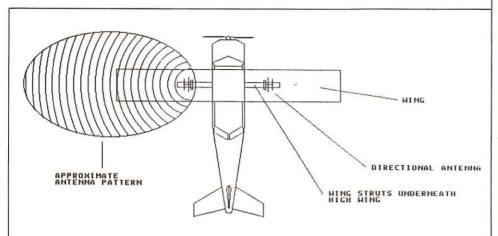
Mr. Bass is part of a 35-member staff in the research department, which includes scientists and technicians who specialize in a variety of wildlife and environmental studies. Everglades National Park employs approximately 100 full-time employees, with another 100 employees used on a seasonal basis.

The Cessna 172 used for the mission is equipped with normal avionics plus LORAN and a radio which operates on NPS frequencies, as well as special attachment points on the wing struts for wildlifetracking antennas. In addition, Mr. Bass has a set of detailed low-level charts of the panther's habitat which are used to pinpoint the animal's location to within a specific group of trees or grasses.



Harry Baughn

Much of the Everglades looks alike at first glance -- It actually supports thousands of species of both plants and wildlife.



The Cessna 172 uses special attachment points on the wing tips for the wildlife tracking antennas, giving almost 360-degree coverage.

Much of the Everglades looks alike at first glance due to a completely flat land-scape and what appears to be a limited variety of vegetation. Actually, the area supports thousands of plant and wildlife species, some of which are not found elsewhere.

Since the panther's habitat includes areas of sawgrass prairies, hardwood hammocks, pine forests and cypress stands, the use of detailed charts is essential in the location and study of the panther's behavior, feeding characteristics, and territory. In fact, Florida panthers may travel as much as fifteen miles in a single night.

In addition to highlighting the locations of the panthers, these special charts of the area are valuable for aircraft navigation as well. Everglades National Park encompasses 1.4 million acres and the Big Cypress Preserve includes 700,000 acres. Light aircraft flying under VFR conditions at low altitudes have few landmarks identified on standard aeronautical charts, so the ability to determine an aircraft's position by finding a particular pond or grouping of trees is a necessity.

The radio tracking equipment used on the mission is manufactured by Teconics of Mesa, Arizona. The receiver section is a portable rechargeable unit which scans preprogrammed frequencies in the 150.0000-151.0000 MHz range. Nonscanning models are also used on occasion. Signals identified by the receiver are patched into the aircraft intercom/head-

phone system and are heard as steady beeps, which increase in volume as the signal intensifies.

The receiver is connected to a signal splitter/combiner, which in turn is connected to dual VHF antennas, cut for the 150.0000-154.0000 MHz band. The antennas are directional types, and are mounted on each wing strut facing away from the aircraft. The resulting antenna pattern provides almost 360-degree coverage, with primary reception areas at the 90-degree (starboard/right-side) and 270-degree (port/left-side) positions relative to the front of the aircraft.



BE A HAM RADIO OPERATOR

Q&A Manual contains all 1,932 questions, multiple choices and answers used in all FCC Amateur Radio licenses, Novice—Extra Class. \$9.95 postpaid. Money-back guarantee. VISA/MC orders accepted 10:00 a.m.-2:00 p.m. (817) 548-9594 or send check to: W5YI, P. O. Box 565101, Dallas, TX 75356.



Harry Baughn

Only 25 panthers remain south of Lake Okeechobee; less than ten live within Federally-protected property.

COMMUNICATIONS 118,1000 Miami Int'l Airport Approach Control 122.2000 Miami Flight Service Station, weather advisories (Enroute Flight Advisory Service -- EFAS) 122.8000 Homestead General Aviation Airport, Airport Advisory Service (AAS) Everglades National Park, Aircraft Operations 123.0500 Homestead AFB Approach Control (GCA) 123.8000 150,0000--151.0000 Radio collar transmitter band (various frequencies and spacing) 172.4250 Big Cypress National Preserve (repeater output) 172.5250 Everglades National Park, primary ops. (repeater output) 172.6750 Biscayne National Park (repeater output) 172.7750 Everglades National Park, fire ops. (repeater output)

Mr. Bass, a self-taught operator of the tracking equipment, has developed a unique ability to quickly pinpoint a panther's location by constantly manipulating the signal gain and antenna switching controls, resulting in a rapid determination of initial bearing and range, then location within a specific quadrant, and finally the exact location of the animal within a group of trees.

This control manipulation by Mr. Bass allows the pilot to fly almost directly to the panther's site, as opposed to first flying toward the general area of the strongest signal, then initiating a series of decreasing orbits around the area until the site is determined.

The radio collars worn by the animals contain a lithium battery with an operational life of approximately two years. The collars transmit a constant-rate tone signal known as an "Activity Monitor." This feature is normally operational at all times. When an animal has not moved for a period of two hours, the Activity Monitor shifts into "Mortality Mode," which then transmits the tone signal at a higher or faster rate.

Although scientists first believed that a panther will move at least once during any two-hour period, actual studies indicate otherwise, resulting in occasional "false alarms" concerning the well-being of a particular animal.

The radio collar may be optionally equipped with a variety of sensors, including temperature, pulse, and other vital sign instrumentation.

Operations

An informal pre-flight briefing acquaints the pilot (and any observers on board) with the last known positions for each of the five panthers being tracked. Generally, aircraft routes to each site do not vary greatly each day, with flights lasting just under two hours and covering approximately 100 miles point-to-point.

After leaving the airport, the mission proceeds toward the first site at 800-1200 feet altitude. As the area is reached, Mr. Bass begins adjusting the gain and antenna switching controls to determine if the animal is to the left or right of the aircraft. As the beeping sounds increase in volume, Mr. Bass continues to fine-tune the system and advise the pilot of course corrections. The aircraft then descends to approximately 200 feet and begins to close in on the panther's location.

When the tones heard are rapid, which indicates "Mortality Mode," the crew prepares themselves for what may be a saddening event in the life of a biologist: the discovery of the death of an endangered animal. Most Mortality Mode indications, however, are false alarms, which are remedied by "buzzing" the suspected site at an extremely low altitude, thus awakening the panther and resetting the transmitter to Activity Monitor status.

Although Mr. Bass can usually identify the location on the first pass, additional passes are sometimes necessary as dense foliage can limit the transmitter's range. In addition, since the tracking antennas are mounted on each side of the aircraft, the pilot may point an antenna directly down at a site by orbiting tightly over the position of the strongest signal, further verifying the location. (Aerobatic-style tight turns and low altitude passes over federal recreational lands require special pilot certification by the U.S. Department of Interior.)

Note that panthers are rarely seen from the air on these missions, as they are generally nocturnal hunters who rest in overgrown shaded areas by day.

Experiments by Mr. Bass which oriented the antennas toward the front of the aircraft proved unsatisfactory, as the sideto-side reception coverage combined with the maneuverability of the aircraft was a more reliable system.

As each panther is located, the aircraft once again climbs to approximately 1000 feet enroute to the next location.

Communications

Radio communications include normal air traffic advisories in the vicinity of the airport, plus mission status reports to the NPS headquarters at Everglades National Park. Contact with Miami Approach Control, Miami Flight Service, or Homestead AFB is initiated when necessary (see attached frequency list).

Interestingly, the federal employees on these missions have often been scrutinized by another group of federal employees: the U.S. Customs Service! Apparently, the angular course plots, rapid altitude changes, and tight turns over specific sites in remote areas also fit the profiles of "drops" attempted by smugglers. Consequently, the wildlife-monitoring aircraft are sometimes targeted and intercepted by Customs aircraft on patrol over South Florida.

Although an air-to-air radio call or hightech verification of registration and transponder "squawk" code by Customs always remedies the situation, NPS staffers are starting to rely on old-fashioned telephones to call the Customs Air Branch before flights.

Further information about the Everglades may be obtained from Mrs. Pat Tolle, Public Information Officer, Everglades National Park, at 305-247-6211, whose cooperation and assistance with this article is appreciated.

uniden \$12,000,000 Scanner Sale

Uniden Corporation of America has purchased the consumer products line of Regency Electronics Inc. for \$12,000,000. To celebrate this purchase, we're having our largest scanner sale in history! Use the coupon in this ad for big savings. Hurry...offer ends September 30, 1990.

★★★MONEY SAVING COUPON★★★ Get special savings on the scanners listed in this coupon. This coupon must

be included with your prepaid order. Credit cards, personal checks and quantity discounts are excluded from this offer. Offer valid only on prepaid orders mailed directly to Communications Electronics Inc., P.O. Box 1045 - Dept. UNI2, Ann Arbor, Michigan 48106-1045 U.S.A. Coupon expires September 30, 1990. Coupon may not be used in conjunction with any other offer from CEI. Coupon may be photocopied. Add \$12.00 for shipping in the continental U.S.A. RELM RH606B-A\$419.95 RELM RH256B-A\$294.95 Bearcat 800XLT-A\$229.95 Bearcat 210XLT-A\$164.95 Bearcat 70XLT-A.....\$139.95 Uniden HR2510-A\$229.95 Uniden HR2600-A1 \$239.95 Uniden PRO810E-A....\$169.95 Uniden CARD-A\$164.95 Uniden RD3XL-A.....\$149.95 Uniden RD99GT-A\$114.95

PON

COUPO

****VALUABLE COUPON ***

Bearcat 760XLT-A

List price \$499.95/CE price \$254.95/SPECIAL 12-Band, 100 Channel • Crystalless • AC/DC Frequencyrange: 29-54,118-174, 406-512, 806-956 MHz. Excludes 823,9875-849.0125 and 868,9875-894.0125 MHz. The Bearcat 760XLT has 100 programmable channels organized as five channel banks for easy use, and 12 bands of coverage including the 800 MHz. band. The Bearcat 760 XLT mounts neatly under the dash and connects directly to fuse block or battery. The unit also has an AC adaptor, flip down stand and telescopic antenna for desk top use. 6-5/16" W x 1%" H x 7%" D. Model BC 590XLT-A is a similar version without the 800 MHz. band for only \$199.95. Order your scanner from CEI today.

NEW! Uniden® Telephones

AM470D-A Uniden answering machine\$69.95
AM464-A Uniden answering machine\$49.95
AM468V-A Uniden answering machine \$49.95
AM460-A Uniden answering machine\$49.95
AM480-A Uniden answering machine\$69.95
FP300-A Uniden feature phone\$34.95
FP302-A Uniden feature phone\$49.95
FP320S-A Uniden feature speakerphone\$49.95
FP322S-A Uniden feature speakerphone\$59.95
XE570-A Uniden cordless phone \$74.95
XE422S-A Uniden cordless speakerphone \$109.95
XE777S-A Uniden cordless speakerphone \$109.95
BT100-A Uniden Trimstyle phone
KT280-A Uniden Family phone with 911 feature\$29.95
FF150-A Uniden Executive phone\$39.95

RELM® RH256B-A

List price \$587.50/CE price \$299.95/SPECIAL 16 Channel • 25 Watt Transceiver • Priority The RELM RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup.
All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority func-tion. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A 60 Watt VHF 150-162 MHz, version called the RH606B-A is available for \$429.95. A UHF 15 watt, 16 channel version of this radio called the RU156B-A is also available and covers 450-482 MHz, but the cost is \$454.95.

*** Uniden CB Radios ***

The Uniden line of Citizens Band Radio transceivers is styled to compliment other mobile audio equipment. Uniden CB radios are so reliable that they have a two year limited warranty. From the feature packed PRO 810E to the 310E handheld, there is no better Citizens Band radio on the market today.

PRO310E-A Uniden 40 Ch. Portable/Mobile CB \$83.95
PRO330E-A Uniden 40 Ch. Remote mount CB\$104.95
PRO500D-A Uniden 40 Channel CB Mobile \$38.95
GRANT-A Uniden 40 channel SSB CB mobile \$166.95
PC122-A Uniden 40 channel SSB CB mobile\$119.95
PRO510XL-A Uniden 40 channel CB Mobile \$38.95
PRO520XL-A Uniden 40 channel CB Mobile \$56.95
PRO530E-A Uniden 40 channel CB Mobile \$79.95
PRO640E-A Uniden 40 channel SSB CB Mobile \$137.95
PRO810E-A Uniden 40 channel SSB CB Base \$174.95

*** Uniden Radar Detectors* * *

Buy the finest Uniden radar detectors from CEI today.
TALKER-A2 Uniden talking radar detector \$119.95
RD3XL-A Uniden 3 band radar detector \$159.95
RD8-A Uniden visor mount radar detector \$89.95
RD9GTL-A Uniden "Passport" size radar detector \$114.95
RD9XL-A Uniden "micro" size radar detector\$144.95
RD27-A Uniden visor mount radar detector\$54.95
RD90GT1-A Uniden remote mount radar det \$109.95
RD99GT-A Uniden remote mount radar detector\$119.95
CARD-A Uniden credit card size radar detector \$179.95

Bearcat® 200XLT-A
List price \$509.95/CE price \$239.95/SPECIAL
12-Band, 200 Channel • 800 MHz. Handheld
Search • Limit • Hold • Priority • Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz. The Bearcat 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 10 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the BC 100XLT-A for only \$189.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Orderyour scanner now.

Bearcat® 800XLT-A

List price \$549.95/CE price \$239.95/SPECIAL 12-Band, 40 Channel . No-crystal scanner Priority control • Search/Scan • AC/DC Bands: 29-54, 118-174, 406-512, 806-912 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz. The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 91/4" x 41/2" x 121/2 If you do not need the 800 MHz. band, a similar model called the BC 210XLT-A is available for \$178.95.

Bearcat® 145XL-A

List price \$189.95/CE price \$94.95/SPECIAL 10-Band, 16 Channel No-crystal scanner

Priority control • Weather search • AC/DC Bands: 29-54, 136-174, 406-512 MHz.
The Bearcat 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions. A mobile version called the BC560XLT-A featuring priority, weather search, channel lockout and more is available for \$94.95. CEI's package price includes mobile mounting bracket and mobile power cord.

President® HR2510-A

List price \$499.95/CE price \$239.95/SPECIAL 10 Meter Mobile Transceiver • Digital VFO
Full Band Coverage • All-Mode Operation
Backlit liquid crystal display • Auto Squelch
RIT • Preprogrammed 10 KHz. Channels
Frequency Coverage: 28,0000 MHz. to 29,6999 MHz. The President HR2510 Mobile 10 Meter Transceiver made by Uniden, has everything you need for amateur radio communications. Up to 25 Watt PEP USB/LSB and 25 Watt CW mode. Noise Blanker. PA mode. Digital VFO. Built-in S/RF/MOD/SWR meter. Channel switch on the microphone, and much more! The HR2510 lets you operate AM, FM, USB, LSB or CW. The digitally synthesized frequency control gives you maximum stability and you may choose either pre-programmed 10 KHz. channel steps, or use the built-in VFO for steps down to 100 Hz. There's also RIT (Receiver Incremental Tuning) to give you perfectly tuned signals. With receive scanning, you can scan 50 channels in any one of four band segments to find out where the

NEW! President® HR2600-A List price \$599.95/CE price \$299.95/SPECIAL

10 Meter Mobile Transceiver • New Features The new President HR2600 Mobile 10 Meter Transceiver is similar to the *Uniden* HR2510 but now has repeater offsets (100 KHz.) and CTCSS encode.

action is. Order your HR2510 from CEI today



BC760XLT 800 MHz. mobile scanner SPECIAL!

* * * Extended Service Contract * * * If you purchase a scanner, CB, radar detector or cordless phone from any store in the U.S. or Canada within the last 30 days, you can get up to four years of extended service contract from Warrantech. This service extension plan begins after the manufacturer's warranty expires. Warrantech will perform all necessary labor and will not charge for return shipping. Extended service contracts are not refundable and snipping, Extended service contracts are not refundable and apply only to the original purchaser. Warrantech does not have an extended warranty plan for handheld scanners. For mobile or base scanners, CB radios or radar detectors a 1 year extended warranty is \$19.9, two years is \$39.99 and four years is \$59.99. Order your service contract today.

OTHER RADIOS AND ACCESSORIES

BC55XLT-A Bearcat 10 channel scanner \$114.95
AD100-A Plug in wall charger for BC55XLT\$14.95
PS001-A Cigarette lighter cable for BC55XLT \$14.95
VC001-A Carrying case for BC55XLT\$14.95
AT054-A Replacement antenna for BC55XLT \$14.95
BC70XLT-A Bearcat 20 channel scanner. \$159.95
BC175XLT-A1 Bearcat 16 channel scanner\$134.95
BC1-A Bearcat Information scanner with CB \$129.95
INF7-A Regency Information Radio\$109.95
INF10-A Regency Information Radio\$109.95
INF50-A Regency Information Radio \$109.95
UC102-A Regency VHF 2 ch. 1 Watt transceiver\$114.95
VM200XL-A Uniden Video monitoring system \$179.95
BP205-A N+Cad batt. pack for BC200/BC100XLT \$39.95
FBE-A Frequency Directory for Eastern U.S.A\$14.95
FBW-A Frequency Directory for Western U.S.A \$14.95
RFD1-A MI, IL, IN, KY, OH, WI Frequency Directory \$14.95
RFD2-A CT, ME, MA, NH, RI, VT Directory \$14.95
RFD3-A DE, DC, MD, NJ, NY, PA, VA, WV Dir \$14.95
RFD4-A AL, AR, FL, GA, LA, MS, NC, PR, SC, TN, VI \$14.95
RFD5-A AK, ID, IA, MN, MT, NE, ND, OR, SD, WA, WY \$14.95
RFD6-A CA, NV, UT, AZ, HI, GU Freq. Directory\$14.95
RFD7-ACO, KS, MO, NM, OK, TX Freq. Directory \$14.95
ASD-A Airplane Scanner Directory\$14.95
SRF-A Survival Radio Frequency Directory \$14.95
TSG-A "Top Secret" Registry of U.S. Govt. Freq\$14.95
TTC-A Tune in on telephone calls
CBH-A Big CB Handbook/AM/FM/Freeband\$14.95
TIC-A Techniques for Intercepting Communications \$14.95
RRF-A Railroad frequency directory \$14.95
EEC-A Embassy & Espionage Communications\$14.95
CIE-A Covert Intelligence, Elect. Eavesdropping \$14.95
MFF-A Midwest Federal Frequency directory\$14.95
A60-A Magnet mount mobile scanner antenna \$34.95
A70-A Base station scanner antenna\$34.95
USAMM-A Mag mount VHF ant. w/ 12' cable \$39.95
USAK-A 4" hole mount VHF ant. w/ 17' cable \$34.95
Add \$4.00 shipping for all accessories ordered at the same time.
Add \$12.00 shipping per radio and \$4.00 per antenna.

BUY WITH CONFIDENCE

To get the fastest delivery from CEI of any scanner, send or phone your order directly to our Scanner Distribution Center. Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. On all credit card orders, the ship to address must exactly match all credit card orders, the ship to address must exactly match the credit card billing address. If the billing address is a P.O. Box Zip* Code, UPS can not deliver to that address. When this occurs, the order must be shipped by mail at a higher cost to you. To avoid this extra charge, you may mail us a check with your order. Prices, terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on backorder automatically or equivalent product substituted unless CEI is instructed differently. A \$5.00 additional handling fee will be charged for all orders with a merchandise ling fee will be charged for all orders with a merchandise total under \$50.00. Shipments are F.O.B. CEI warehouse in Ann Arbor, Michigan. No COD's. Most items listed have a manufacturer's warranty. Free copies of warranties on these products are available by writing to CEI. Non-certified checks require clearance. Not responsible for typographical errors.

Mail orders to: Communications Electronics,"

Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$12.00 per scanner for U.P.S. ground shipping and handling in the continental U.S.A. For Canada, Puerto Rico, Hawaii, Alaska, or APO/FPO delivery, shipping charges are two times continental U.S. rates. If you have a Discover, Visa, American Express or MasterCard, you may call and place a credit card order. 5% surcharge for billing to American Express. Order toll-free in the U.S. Dial 800-USA-SCAN. In Canada, dial 800-221-3475. FAX anytime, dial 313-971-6000. If you are outside the U.S. or in Michigan dial 313-973-8888. Order from CEI today. Scanner Distribution Center* and CEI logos are trademarks of Communications Electronics Inc.
Sale dates 3/15/90 — 9/30/90 AD #020890-A
Copyright® 1990 Communications Electronics Inc.

For credit card orders call 1-800-USA-SCAN



Consumer Products Division

P.O. Box 1045 T Ann Arbor, Michigan 48106-1045 U.S.A. For orders call 313-973-8888 or FAX 313-971-6000

The BBC's Pamela Creighton

by Alison Johnston

"Crisis Creighton" is what they call her in Bush House. It's strange, but when something awful happens, newsreader Pamela always seems to be the one to announce it to the world. The Challenger spacecraft exploding, the deaths of two popes in the same year, the nuclear accident at Chernobyl, the assassination of Mrs. Gandhi: "Even her son didn't believe it till he'd heard it from us," says Pamela.

Mrs. Gandhi's death was a difficult announcement for her. Born of English parents in Delhi in 1933, her family had moved in the same circles as the Gandhis, and as a child she mixed with their children. Her father, a steam engine designer and engineer with the Midland Railway, was asked by the British government to go out to India in 1922 to help build the North Western Railway at Peshawar, near Rawalpindi. Here he and Pamela's mother started their married life -- with very little besides a tent and a motorbike with sidecar.

So how did Pamela make the leap from Delhi to the Bush House newsroom? Her father had a lot to do with it. By 1955 she had finished her education in England and the family had returned from India for good. She planned to take up a career in hotel work in South Africa but her father -- an astute man by all accounts -- sensed that she would be unhappy with the political situation there and sent her an ad from the Daily Telegraph.

The BBC was advertising for studio managers. To please her father, Pamela filled in the application form -- and got the job! A keen listener to the World Service in India, she expressed an interest in what was then the External Services and began work as a studio manager/announcer for the BBC North American Service.

Those were the days when women were not considered fit to read the news. For one thing, their voices were thought too high and so not authoritative enough. Women were allowed on the air but tended to read recipes and items about knitting. After all, says Pamela ironically: "What



woman knew anything about the news?"

It was as late as the 1970s that things began to change. Women had started to appear on television -- they were, after all, decorative! Pamela was determined that if there were any chance of women being permitted to read the news, she would be in at the beginning. And so she was, becoming in 1972 only the second female newsreader on World Service.

So what is the attraction of this often nerve-wracking job? "Being able to give people the opportunity of listening to the truth, in areas where they've never heard the truth in their lives," says Pamela.

The skill of imparting news is not one

she feels can be taught. "You've got to be interested in passing on information. The feeling must come from inside. It can't be put on you. You must be yourself and only then can you begin to communicate with other people.

"I suppose it's like the difference between a great actor and a darned good performer. There's something a great actor has which comes from inside."

The usual advice to a novice is to imagine reading the news to one person but, she prefers to think in terms of a collection of different people: "one person sitting here, another standing over there, another working there, someone reading there -- some of them very well informed, others who know nothing of what I'm telling them."

She has obviously managed this art of communication to an extraordinary extent. Traveling on a bus from Alexandria to Cairo, Pamela was tapped on the shoulder from behind by someone who had heard her voice and asked: "Do you broadcast?" "Yes." "Are you with the BBC?" "Yes." "Are you Pamela Creighton?" Right again.

There have been moments, though, when Pamela might have wished the ground would open up and swallow her -- like the time she was announcing for the North American Service and faded out a football match before the closing moments.

It wasn't just any football match. It was the World Cup final between England and West Germany in 1966. The match had gone into extra time with the score standing at two-all. Pamela, conscious that the next program, classical music, was scheduled, let the football run as long as she dared but made the fatal decision to abandon the match, moments before Geoff

Hurst scored the clincher for England.

"The whole of Bush House exploded. I went through the worst week of my life -- I really thought I was finished. To me Brahms had seemed more important than football. I learned a lesson then -- that football is sacrosanct."

"You must

and only

then can

be yourself

you begin to

communicate

with people."

She has been guilty of few howlers since, but does recall her husband, who also used to work for the BBC, once announcing: "This is the British Broadcorping Castration."

A familiar voice to millions of listeners, Pamela receives about five letters a week from all over the world, answering each one personally from her back kitchen in Twickenham.

"I find some of them very moving. People write from abject poverty, managing to beg or borrow money for a

stamp and airmail letter and ask me things like: 'Can I be your adopted son? Can you send me a watch? How can I get to England?' They don't so often want to marry me -- they all want me to be their mother!" says Pamela a little ruefully.

It was a lonely experience for her when she left India in 1945 to attend Cheltenham Ladies College. Intensely homesick, she detested, above all, sport. She had contracted typhoid in India and survived thanks to her father, who had seen that all the family were inoculated.

There were no drugs in those days, only the body's ability to fight the disease. Her doctor warned her: "You'll get better but you're going to be very large." That put an end to the ballet dancing at which she had excelled, and made sport difficult.

"One term," she announces proudly, "I managed to be 'ill' every Thursday." Thursday was "gym." History, geography, and English were her favorite subjects but her burning ambition was to be a brain surgeon. She had to drop that idea when she realized the astronomical cost to her

parents of paying for a further nine years of training.

Traveling back and forth from India to school in England gave Pamela a taste for travel which has never left her. The Middle East is a favorite destination -- especially Egypt and Jordan -- with Cyprus a close runner-up.

What about unwinding after work? She is an avid stamp collector: "Of course, it's a great bonus working at the Bush House." Gardening is another passion, shared

by her husband who grows chrysanthemums.

The garden is a long rambling one with a rustic wooden gate at the bottom leading to a further wilder patch and overlooked by several sad-looking horse-chestnut trees, lopped by the 1987 hurricane.

As I left her house in leafy Twickenham, hastily avoiding the onslaught of rugby fans arriving for the England-Fiji International, it struck me what a good thing it was that Pamela Creighton's career had not ended in 1966 over a "mere" football match! The BBC World Service would have been much the poorer.

Reprinted from "London Calling."

STOCKS.....OPTIONS.....

Turn Your PC Into A

MARKET QUOTATION MONITOR

New book covers complete information on financial news and market quotes for your PC.

Topics include:

- Data Encryption
- Password Methods
- Receiver Unit Design

Covers quotation processing and data broadcasting from the trading floor to the desktop, \$19 plus \$2 S/H (includes demodiskette).

Send for FREE catalog of

- DATA RECEIVER KITS
- QUOTE DISPLAY SOFTWARE
- DESCRAMBLING UTILITIES

303-223-2120 (anytime)

DATArx

111 E. Drake Rd, Suite 7041 Fort Collins, CO 80525

LOG MORE RTTY

with the Essential RTTY Frequency List

Over 1,000 active RTTY listings with call, location, speed, shift, etc. \$10.95 + \$2 s/h, \$3 foreign.

Radioteletype Monitoring -The Complete Guide

Makes tuning in RTTY easy; Just \$9.95 plus \$2 s/h, \$3 foreign. Both books \$18 plus shipping. Catalog \$1, free with order.

P.O. Box 493-G Lake Geneva, WI 53147

INPUT and FEEDBACK

When it comes from our readers, it's our favorite terminology. Send us your QSLs, pics of your monitoring post, your letters to the editor; let the columnists know your tips, experiences, and opinions! *MT* will be all the better for it.

mi

Shortwave Broadcasting

Glenn Hauser

Box 44164-MT Tucson, AZ 85733

AFGHANISTAN Radio Afghanistan, English to Southeast Asia, has been retimed to 0930-1030 UTC, via Soviet relays on 17720 and 15350; also announced on 4940 (Victor Goonetilleke, Sri Lanka, Radio Netherlands Media Network)

ALBANIA (non) Ex-King Zog's son, now living in South Africa, plans clandestine shortwave broadcasts, unknown whence but his organization is based in Paris (Austrian SW Panorama and RNMN)

ANTIGUA Four harmonics were all audible around 2218, BBC x 4 on 23900 and x 2 on 30780; Deutsche Welle seconds on 30210, 30820 (Hauser, AZ)

ARMENIA Local programming from Yerevan on 4810 can be heard until blocked by South Africa at 0300; but one night during the conflict with Azerbaijan only music was heard from 0211 (Hans Johnson, GA)

AUSTRALIA Is Radio Australia's *Communicator* kaput or just on summer vacation? It's been replaced by reruns of *Bright Sparks*, about the early history of radio in Australia, Sat. 1030, Sun. 1430, Mon. 0730 (DX Listening Digest)

AZERBAIJAN Radio Baku domestic service on 4785 from 0215 until a Moscow relay at 0300 (Hans Johnson, GA, RCI SWL Digest) Another program on 4957.7, around 0400 in Russian (Brian Alexander, PA, NASWA *Journal*) During the uprising, the two services were combined (Jonathan Marks, *RNMN*)

AZORES Radio Clube do Angra, 909 kHz, has been relayed by a utility transmitter on 13584, heard often as early as 1730 and as late as sign-off just after 0200 with two anthems (8 *Play-DX*ers, mostly in Italy)

BAHRAIN (non) Radio Bahrain relayed via Sulaibiyah, Kuwait, daily 1130-1230 on 15505 in Arabic (Leigh Morris, Adelaide, Radio Australia Japanese *DX Time*)

BANGLADESH English from Radio Bangladesh: 0800-0830 and 1230-1300 on 15195, 11705; 1815-1900 on 15255, 11705, the last pair also carrying other languages between 1315 and 2000. Home service: 0000-0330 and 1230-1600 on 4879.9, 0430-0905 on 15535, 0900-1235 on 7079.9, 1230-1730 on 15535, which alternates with 15520 (Victor Goonetilleke, *UADX*) 15533 and 4880 at 1235 (Craig Seager, *Australian DX Nws*). 15257 from 1358 to 1545 and 1700-2000 in various languages (Ernie Behr, Kenora, Ont., RCI *SWLD*)

BHUTAN BBS has finally made it to North America. Heard on 5023.4 between 1315 and 1500 sign-off, with IDs on the quarter-hour; squeezed between China on 5020, Cuba on 5025 (Ed Kusalik, Alberta, *DX Spread*) Also audible one morning only from 1449 to 1501 (Bruce MacGibbon, OR, *DX Spread* ed.)

BOLIVIA Radiodifusora Tarabuco is a new station in the town of the same name, heard at 0030 to 0200 variable on 5215, announced as 5216 (Hirotsugu Nabeshima, Peru, *Radio Nuevo Mundo*)

BOTSWANA Radio Botswana plans to use three 50 kW shortwave transmitters from Sebele, Near Gaborone on three frequencies simultaneously, chosen from 3350, 4820, 5955 and 7255; and there will be independent sideband feeders for AM and FM relays elsewhere (Ted Makgekgene, RB Director General, International Broadcast Engineer via OzDX)

BRAZIL Radio Anhanguera is heard until about 0300 on 11833 variable; just below El Espectador, Uruguay on 11835 until 0200 (Ernie Behr, *DXLD*)

BULGARIA Radio Sofia's anticipated English schedule for

March 4-24 (after which times shift one hour earlier and some frequencies change): North America, 0000-0100 on 11680, 15330; 0400-0500 on 11720, 11735. Europe, 0730-0800 on 11720, 15160, 17825; 1930-2000 on 9700, 11660, 15330; 2130-2200 on 9700, 11660, 15330; 2230-2330 on 11680, 15330. Africa, 0400-0500 on 11765, 15160, 15310; 1530-1630 on 11735, 15310, 17825; 1830-1930 on 11735, 15310, 17825 (via John Carson, OK)

CAMBODIA (non)

Democratic Kampuchean Radio is a completely different station from Voice of Democratic Kampuchea, which it resembles; believed to support the anti-Heng Samrin group, but not

SOFIA PLOYON BOURGAS

VODK's Pol Pot. Heard at 1800-1855 on 6974, no doubt from China as it made frequency change at same time as Radio Beijing. D.K.R. was the name of the Cambodian government station in 1977 (Yoshinori Kato, Radio Japan DX Comer)

CAMEROON Radio Cameroon, Yaounde, seems off shortwave now, not heard for some time on 4850, 6060 or 9745. Both Douala and Bertoua are also inactive. Garoua uses 7240 all day and Buea, Bafoussam, are operating on full shorwave schedules (C. Aryommu, Nigeria, *Sweden Calling DXers*)

CANADA Some, but not all airings of RCI *SWL Digest* have been shifted temporarily to 24 hours later until March 24, in order to accommodate a special series on Saturdays. So until then, listen for *SWLD* at these UTC days and times: Sun. 0037, 0337, 2137, 2233, 2307, Mon. 0107, Tue. 1333, 1907, Wed. 0407. After that, 0337 and 2137 should move back to Saturday; 2233 should become Sat. 2107; 0107 should return to UTC Sun.

A Matter of Survival is the special series, with David Suzuki on the environment: Fri. 2207, Sat. 0307, 2137, 2207, Sun. 0107, Fri 1333.

RCI's German service got another reprieve. Check 21545, 17820, 15325, 13650, 7235, 5995 at 1730-1800 to hear whether it survives with commercial underwriting, or has ceded its timeslot to Russian.

COLOMBIA (non?) Radio Patria Libre was on 6300 with coo-coo chimes and ID at 0115 (Hans Johnson, GA, DXLD) Now varies around 6290 at 0030-0115 daily (BBC Monitoring)

COSTA RICA Radio for Peace International has dropped 25947 but it could resume in March or April; the one-hour break between afternoon and evening broadcasts has been eliminated so evening shows appear one hour earlier. At 2000-2330 and 2330-0300, 21566 and 13660 are used, with 7375 joining at 2330. Then from 0315, 7375 USB comes back with another repeat until 0645, sometimes later; this applies to weekdays. On weekends, 1800-2330 on 21566 and 13660, 2330-1030 on 7375. As a result, our WORLD OF RADIO is now scheduled: Fri. 2000, 2330, Sat. 0315, 0645, 1015?, 1930; UTC Sun. varying widely 0030-0230 plus further repeats; 2230; Tue. 2230; Wed. 0200, 0545. If missing on 7375, try 7425, where heard one evening by Terry Palmersheim, WA.

CZECHOSLOVAKIA Radio Prague has resumed the interval signal it used until 1948, from Dvorak's New World Symphony (Bruce MacGibbon, and Christos Rigas, W.O.R.)

CHILE Radio Nacional, still in the hands of the military government, may be privatized after March 14; has been using 15139.5 only, at 0930-1215, 1500-1815, 2140-0330. Other stations may be returned to original owners: Radio Corporacion to the Socialist Party; Radio Balmaceda to the Christian Democrats; and Radio Magallanes to the Communists (Gabriel Ivan Barrera, Radio Nederland Radio-Enlace) Radio Magallanes announced its broadcasts via Moscow ended, in anticipation of resuming operations in Chile itself (Austrian SW Panorama)

A new station has been heard on 5825, Radio Tencan (?) Evangelica, at 0136-0304 with religion (Barrera, RN Radio-Enlace)

DENMARK (non) Radio Denmark's new relays via Norway are to run on this complete schedule of 25-minute broadcasts: 1530 on 15310, 11845. 1630 on 15220, 17790. 1730 on 21705, 15220, 9655. 2130 on 15165, 11850, 9605. 2230 on 11850. 2330 on 9605. 0030 on 9610. 0130 on 11925, 9615. 0230 on 15305, 9565. 0430 on 11865, 9585. 0630 on 15160, 5980. 0730 on 21730, 15165. 0930 on 17740. 1030 on 25730, 21705, 15165. 1130 on 25730, 21705. 1230 on 21705, 15165. 1330 on 21710 (World of Radio) Note 15165 is still among the frequencies, but no longer from Denmark.

DJIBOUTI Radio France International will have three 500-kW shortwave relay transmitters on the air from here by the end of 1990, primary coverage a 5 megameter radius from Jibuti (as BBC Monitoring spells it).

ECUADOR It's rare for a mediumwave harmonic from here to make it all the way to North America, but Radio Francisco Orellana was heard on 2060 kHz, announcing 1030, around 0500 (Don Moore, MI, *DXLD*)

HCJB hopes to install new SSB transmitters in Pifo next month, two in operation, one as standby; rhombic antenna for one, another connectable to any existing antenna; main target Europe but also as back up for Americas (Brent Allred, HCJB, DXLD)

DXPL is ofering a new "World by 2000 Confirmed Stations Award" if you send photocopies of QSLs from at least five of the eleven stations operated by HCJB, FEBC, TWR, ELWA, from at least three of the organizations in five different continents (Andex International via John Carson, OK)

ETHIOPIA Voice of Ethiopia covered VOA and ABC on 9660, in English at 1800-1826 (Don Moman, Alberta, Fine Tuning)



GREECE Voice of Greece has consolidated the Australian services at 2100-2150 and 2200-2250, eliminating the break on 9425, but 9395 and 7430 still go off at 2150. The same consolidation goes for

North America, at 0000-0350 on 9420, 9395, 7430 (Christos Rigas, Chicago) They use two 100-kW transmitters at Avlis, beamed 323 and 285 degrees and relay by phone line to a 250-kW VOA transmitter at Kavala, limited capacity since it has no antennas for North America, but beams 355 degrees. English news at 0130 and 0340.

The first program of Radiofonikos Stathmos Makedonias relays mediumwave with a new rhombic antenna at 315 degrees toward Europe on 11595. Its other 35-kW transmitter is beamed 115 degrees to Cyprus and the Mideast on 9935; both from 1000 to 2300 on weekdays, 0600-2230 on Saturday, Sunday, Greek holidays. It also uses the VOA Kavala 250 kW on 9425 at 1900-2100, to Europe at 355 degrees, with news in Greek, Old Greek folk songs, modern Greek songs, American jazz and pop (John Babbis, Silver Spring, MD)

GUAM AWR has announced that KSDA will install a third high-power transmitter this year, at least 100 kW, to enhance broadcasts to East Asia (Arthur Ward, WDXC *Contact*)

GUINEA Radio Conakry on 4899.8 from 2050 to 2330 in French and venaculars (Dario Monferini, Italy, *Play-DX*)

ICELAND Rikisutvarpid's schedule of domestic program relays on USB: 1215-1245 on 15790, 15767, 13861, 11418; 1410-1440 on 15767, 13855, 13830; 1855-1930 on 13855, 11418, 9268, 7870, 3295; 1935-2010 on 15780, 15767, 13855; 2300-2355 on 13855, 11418, 9286 (BBC Monitoring) That's 9268, and it usually closes around 2330 (Ernie Behr, Ont.)

INDONESIA One-time reception of RRI Ujung Pandang on 9551, abruptly fading in at 0156 and out at 0215 seemed to correlate with the Newcastle earthquake, immediately after it happened (Bob Padula, Australia, DXLD)

IRAN Islamic Republic of Iran Broadcasting, in English; 1130-1225 on 11790, 9685; 1930-2030 on 9022, 6030 (via Kevin Klein and Tom McKeon)



KBS

KOREA, SOUTH Topics on Listeners' Forum, Fridays on Radio

IRIB



Korea: March 2 and 9, personal tips on proper ways of studying for life-long education; March 16, 23, 30, if you were granted another life, how would you live it? Contribute by letter or tape to *Listeners' Forum*, English Service, Radio Korea, KBS, Seoul, Korea; or

fax to Seoul 781-3799 (via Tom Kuca, NY)

MOROCCO The VOA relay station, now under construction, should be prefaced with "USS" like the Courier of the 1950s. This station also "floats". So far it has required half a mountain of fill to get the foundation tops above sea level. Some wag in engineering suggested that now that they have cut the mountain down they should use that for the station site and forget the tidal lake. And it seems some problem has developed with the foundations and that all have had to be jack-hammered out and will be replaced. At this rate the cost of the station is sure to rise far above the published price of more than \$200,000,000. With all the glasnost', why build the station anyway? (Review of International Broadcasting)

NAMIBIA (non) Voice of Namibia, SWAPO clandestine programs via Zambia and Zimbabwe have been discontinued. They were also dropped in 1989 from Ethiopian and Tanzanian shortwave facilities (BBC Monitoring)

NETHERLANDS (non?) A new unofficial station is Quality Radio, heard Sundays at 0900-1100 and 1900-2100 on 9985; 500 watts. Address is P.O. Box 85455, The Hague 2508 CD, Holland (RCI *SWL Digest*)

NEW ZEALAND Radio New Zealand International inaugurated its new 100-kW transmitter on schedule with 0400 UTC "bless this transmitter" prayers in Maori and English — another missionary broadcaster in the making? Or just another country where church and state are not separate. Then numerous greetings from officials and stations on various Pacific islands. At 0555, 17680 switched to 9850 for opening of the Commonwealth Games. Just before 0400, the old 7.5 kW transmitter on 17705 was supposedly switched off for the last time, following an unpublicized hour of reminiscences about the old Radio New Zealand (Bruce MacGibbon, OR & gh) The tentative schedule for 5 March to 5 May 1990 (alternates in parentheses): Polynesia 1700-1900 on



Shortwave Broadcasting

17730 (17680 or 15150), 0300-0600 on 17705 (17680 or 15485). Melanesia 1905-2100 on 17730 (17680 or 15485), 0630-0930 on 15485 (11780 or 9850). General Service 2100-2400 on 17730 (17680 or 15485) (A H Marr, RNZ) 15485 has utility interference, and other broadcasters are on 17705 and 17730. They should stick with clear 17680.

POLAND Radio Scandinavia is expected to undertake a four-week test via Radio Polonia facilities, Saturdays at 1030-1200 on 9675, 9860, 11815 with Top 40 music (Sweden Calling DXers and RNMN) The station/program had previously broadcast via Andorra and Italy

ROMANIA Two weeks after the execution of Ceausescu Radio Bucharest also abolished its identification signal due to its association with the old regime. The new one is called "Lion Cubs" (Bruce MacGibbon, DX Spread) Continued poor reception of the evening broadcasts supposedly for North America leads monitors here to try those targeted elsewhere, and with better results: best at 0645-0715 for the Pacific on 15335, with 17805 also audible (Larry Shewchuk, Winnipeg, DXLD) Best at 1500 on the South Asian beam, 15250 (Bob Rankin, Tonganoxie KS) New IS at 1458, best on 15250, parallel 15335, weak on 17720, under Chinese jammer on 17745 (Ernie Behr, Ont.) Best at 1730 on 15365 (Bruce MacGibbon, OR)

This must be a first in international broadcasting: Radio Bucharest said it had not been allowed to transmit the real Romania under Ceausescu, apologized for a daily flood of lies and misrepresentations for 25 years (Austrian SW Panorama)

SRI LANKA Summary of clandestine activity: JVP Radio, 4432, has been busted. Voice of the Tamil Homeland, an operation of the EPRLF, the Indian-backed provincial government in the northeast, in Tamil 0130-0215 on 6740-6750 variable, again at 1030-1115, subject to jamming. Same station runs the Revolutionary Voice in Sinhala on 6300 at 0230-0300, 1130-1200 on Saturday, Sunday, Wednesday. Nidihas Handa, anti-JVP station on 5304 at 0100-0145, and on 7010 at 0330-0415, the same three days and sometimes others. The 6300 outlet is very strong in Colombo, at least 5 kW. A new station also belonging to the EPRLF, called Voice of Eelam, is on 7000 kHz daily at 0200-0300 and 1300-1400, the last quarter of each in English; quite strong in Colombo, probably from Jaffna (Victor Goonetilleke, RNMN, UADX, and Media Network)

SUDAN Radio Omdurman on 11635, ex-11625, with English news until 1956 (Bob Padula, Australia, RCI SWLD)

(non) Radio SPLA, announcing daily broadcasts in English and another language, on 9550 and 11710 from 1300, English ID at 1359 (Gary Schlager, TX)

SWEDEN Though intended for South Asia, Radio Sweden's new 11760 at 0100-0130 in English is very good, even orriding Havana (Bill Peek, NC)

Thanks to the Swedish welfare system, Radio Sweden's DX editor George Wood is on paternity leave in California until July. This should result in more shortwave DX news and less computer, satellite and miscellaneous media news on the Sweden Calling DXers broadcasts compiled by his substitutes; listen Tuesdays at 1540, UTC Wednesdays 0110 and 0240.

Just before departing, George revealed that \$9 million had been granted for three new shortwave transmitters to replace the old ones from 1992 to 1994. The 17-year-old units are worn out; the new ones will be SSB-capable (World of Radio)

TAIWAN (non) Voice of Free China's planned summer relay schedule via WYFR in Florida, March 25 to September 29, in English: 5950 at 0200-0400 on 355 degrees, with a second transmitter added at 0300-0400 on 285 degrees. 5950 also at 0700-0800, 285. 9680 at 0200-0400 beamed 315. 11740 at 0200-0300 at 222. 15440 and 17845 at 2200-2300 at 44 degrees, all 100 kW

(WYRF via DXLD)

THALAND The home service on 4830 went off the air, then came back a few weeks later carrying the foreign service, including English at 1130-1230, parallel 9655 and 11905 (Victor Goonetilleke, Sri Lanka, RNMN)

TURKEY Ankara Police Radio moved again, heard on 7370, opening at 0455 (Brian Alexander, PA, Fine Tuning)

UKOGBANI The most active AFRTS relay frequency lately has been 9334.4 LSB, heard at 0500-0630 parallel 9242.3 (Ernie Behr, Ont., DXLD) 9334.2 LSB at 2052 (Russ Sampson, Canouan, Grenadines) 9334 LSB at 0850 past 0930 (Larry Russell, MI)

These transmissions are SSB feeders from Barford to Lajes in the Azores, by the US Defense Communications Agency heard regularly on one or two of these during 1989: 4042.2-U, 5377.5-U, 7571.8-L, 7910.0-U, 9242.4-L, 9334.3-L, 9929.3-L, 10537.8-L, 13651.3-L, 16041.3-L, 18741.3-L. Other frequencies reported elsewhere during 1988-1989, but not heard by me: 5230.2-L, 5370.5-U, 7565.5-U, 7568.9-U, 9239.3-U, 9926.3-L, 9934.1-U, 19291.4-L (Peter Schoeltzel, DSWCI Shortwave News)

USA WWCR, Nashville, sends its program schedule; 15690 until 0200, then 7520. Not all of it is preacher after preacher. Program Guide airs Monday-Friday at 1305-1310, Tuesday-Saturday 0305-0310. New Horizons Radio Travelogue, about U.S. cities, Mon-Fri 1605-1610. Israel Press Review, Sat. 1945-2000, Sun. 1930-1945. Beth Chaim (a "Christian Jew" program?) Mon-Fri 2030-2045. Traditional Latin Mass, Sun. 1700-1730; What Catholics Believe, Sun. 1730-1800, Mon. 0200-0230. The campy Unshackled, salvation stories complete with Hammond organ, weekdays 2300-2330, Saturday 1600-1630, Monday 0230-0300. Dramatized Scriptures, weekdays 1945-2000.

Non-English segments: Weekdays 2330-2400 Spanish; 0130-0145 Tue & Sat Spanish, Wed French, Thu German, Fri Arabic; 0145-0200 Tue-Sat Mandarin. Sun 2345-2415 French. The overall transmission schedule is 1300-0600 weekdays, 1500-0600 weekends (Review of International Broadcasting)

Voice magazine, the bimonthly with VOA articles and schedules, is in great demand around the world, but funding for it has run out. It will continue only if it can be privatized (ANARC Newsletter)

USSR Kazakh Radio, domestic service program one has resumed old frequency 4545 after several years on 4610, heard at 1450-1615, parallel 11950, 9780, 6180, 5970, the last two unheard in Japan for a long time (Yoshinori Kato, Radio Japan DX Corner)

Radio Station Peace & Progress, English schedule anticipated for March 4-25: Europe, 2200-2259 on 9610, 7360, 7215, 6145, 4795. Southeast Asia, 1300-1359 on 17870, 17840, 17635, 15535, 15520, 15420, 15330, 15130, 11870. Southwest Asia, 1630-1659 on 15320, 12065, 11910, 9705. Africa, 1630-1659 on 17565, 15585, 11980, 11850 (via John S. Carson, OK)

VIETNAM Several southern provinces during the war years were consolidated into fewer larger ones. Now they are separate again, making more provincial shortwave stations possible. Nghia Binh is divided into Quang Ngai and Binh Dinh; Phu Khanh into Phu Yen and Khanh Hoa; Binh Tri Thien into Quang Binh, Quang Tri and Thua Thien (Isao Ugusa, Japan, World of Radio)

Glenn Hauser invites you to listen to his broadcasts; see CANADA, and COSTA RICA, above. WORLD OF RADIO is also scheduled on WRNO, New Orleans: UTC Thu 0130, 1630; Fri 0000, 0130; Sat 0400; Sun 0030, 2130 -- on 15420 before 0000, then 7355, and after 0400 on 6185. Times vary widely, so stay tuned if not heard at first. All WRNO times move one hour earlier by UTC and some frequencies change the first Sunday in April due to DST. Also check out Glenn's publications REVIEW OF INTERNATIONAL BROADCASTING and DX LISTENING DIGEST. Samples in North America are \$2 each, elsewhere 7 IRCs or US\$3. Ten-issue subscriptions US\$21 each or both for US\$40. Overseas airmail, \$27, \$29 or \$31 depending on the zone; remittances must be in US\$ and on a US bank, or by postal money order, to Glenn Hauser, Box 44164-MT, Tucson, AZ 85733, USA.

Broadcast Loggings

Let other readers know what you're enjoying. Send your loggings to Gayle Van Horn, c/o MT, P.O. Box 98, Brasstown, NC 28902. English broadcast unless otherwise noted.

0028 UTC on 9925

BELGIUM: B.R.T. Comic opera and Flemish folk music program. (John Carson, Norman, OK)

0041 UTC on 9600

PORTUGAL: Radio Renascenca. Portuguese. Religious discussions and interviews to station ID. Fair signal quality with interference until 0117 UTC sign-off. (Robert Landau, Secaucus, NJ)

0110 UTC on 9575

ITALY: R.A.I. International news and UNICEF report on Third World children and their problems. Parallel frequency 11800 kHz audible. (Bob Fraser, Cohasset, MA)

0112 UTC on 5930

CZECHOSLOVAKIA: Radio Prague. National news and ID. Editorial discussing events of 1968 and 1989. (George Neff, Lutz, FL) Monitored at 0300 UTC on 7345 kHz. (John Carson, Norman, OK)

0135 UTC on 9875

AUSTRIA: Radio Austria International. In depth interview on the end of the superpower influences in Europe. (Bob Fraser, Cohasset, MA) Audible on 6155 kHz at 0543 and 9870 kHz at 0230 UTC. (John Carson, Norman, OK)

0300 UTC on 3380

MALAWI: Malawi BC Corp. Chichewa. Closing notes of Malawi anthem, and opening program bits. Tone signal and station ID for fair signal quality. (Sam Wright, Biloxi, MS)

0308 UTC on 9765

USSR: Ukraine. Radio Klev. Editorial asked "Was Afghanistan the Soviet Vietnam?" and discussion on Soviet republics. Monitored on 0300 UTC on 7400 kHz. (John Carson, Norman, OK) Audible on 9765 kHz at 0050 UTC with "Ukraine Today." (Bob Fraser, Cohasset, MA)

0356 UTC on 7400

USSR: Radio Yerevan. Russian. Male/female announcer duo with chat, ID, and interval signal at 0359 UTC. International news topics at 0400. (John Carson, Norman, OK)

0410 UTC on 4976

UGANDA: Radio Uganda. Very weak signal, making out bits of news items on Uganda. Station ID and fading during an African music tune. A real strainer to copy this time.-ed.

0435 UTC on 15170

TAHITI: Radio Tahiti. French. Male/female announcer duo with friendly talk and Tahitian music program. (Tim Johnson, Galesburg, IL)

0450 UTC on 3275

VENEZUELA: Radio Mara. Spanish. Excellent Latin music program to "Radio Mara" ID at 0455 UTC, and local ads and comments. (Frank Mierzwinski, Mt. Penn, PA)

0557 UTC on 14918

KIRIBATI: Radio Kiribati. Country and western music, followed by island news and IDs to signal fade out at 0620 UTC. (Tim Johnson, Galesburg, IL) 0556 UTC signal tone and island music to local time check. Clear ID with news and weather.-ed.

0620 UTC on 4835

MALI: Radiodiffusion Malienne. French. Numerous announcements and ID noted as "ici Malienne." Native African music program. (John Carson, Norman, OK)

0626 UTC on 6095

MOROCCO: VOA Tangier relay. "VOA Sunday Morning" show featuring music from Belinda Carlisle. Poor reception with co-channel station interference. (Robert Landau, Secaucus, NJ)

0730 UTC on 9545

SOLOMON ISLANDS: S.I.B.C. Island merchant commercials, station ID and national news. (Tim Johnson, Galesburg, IL)

0750 UTC on 9580

AUSTRALIA: "Waltzing Matilda" interval tune opener for "Pacific Beat" show and international newscast at 0800 UTC. (John Carson, Norman, OK)

1005 UTC on 4830

VENEZUELA: Radio Tachira. Spanish. Latin vocals and instrumentals to ID. Utility interference throughout programming. (Harold Frodge, Midland, MI)

1036 UTC on 6160

CANADA: CBN. Newfoundland weather forecast, "Weekend Arts Magazine" show featuring local comedy entertainment. (George Neff, Lutz, FL)

1105 UTC on 11735

NORTH KOREA: Radio Pyongyang. Commentary on the unshakable faith in socialism and the ongoing struggle against US capitalism. (George Neff,

Lulz, FL) Audible on 15115 kHz at 0015 UTC. (Bob Fraser, Cohasset, MA)

1153 UTC on 3395

PAPUA NEW GUINEA: New Britain-Radio East New Britain. Pidgin. Lady DJ features country and rock oldies. Local PNG time check and ID. Monitored other PNG stations on 3220/3245/3385/ and 4890 kHz. (Harold Frodge, Midland, MI)

1500 UTC on 4775

INDONESIA: Java-Radio Republik Indo-Jakarta. Indonesian. Station ID and news coverage to tune-out, with fair signal quality.-ed.

1541 UTC on 25790

SOUTH AFRICA: Radio RSA. Discussion of Aquaculture and news headlines in brief. Station sign-off at 1555 UTC. Monitored at 1557 on 21535 kHz in Chichewa and English. (John Carson, Norman, OK)

1837 UTC on 13610

KUWAIT: Radio Kuwait. News in progress at tune-in with ID break at 1837 UTC. Co-channel interference from Abu Dhabi on 13605 kHz. (Stephen Price, Conemaugh, PA)

1844 UTC on 12005

TUNISIA: RTT Tunisia. Arabic. Closing Arabic music to clear ID as "ida' atu algumhuriya al Tunisiyya." (Stephen Price, Conemaugh, PA)

1916 UTC on 11915

BRAZIL: Radio Guacha. Portuguese. Local ads and tropical classics to a telefax service. Newscast "Noticias Internacional" with BBC remote to news at 1920-1923 UTC. Station ID "Gaucha." (Harold Frodge, Santos, Brazil)

1920 UTC on 9535

QATAR: Qatar Broadcasting Service. Arabic. Great Middle Eastern music program with ID break. (Tim Johnson, Galesburg, IL)

2000 UTC on 9870

SAUDI ARABIA: B.S.K.S.A. Arabic. Opening station ID and newscast with an excellent signal! (Stephen Price, Conemaugh, PA)

2024 UTC on 9022

IRAN: Voice of the Islamic Republic. Excellent reception to hear news headlines and blast of the USA for their Panama involvement. (Stephen Price, Conemaugh, PA) Monitored also on 15084 kHz. (Lance Micklus, Essex Junction, VT)

2031 UTC on 5952

YEMEN ARAB REPUBLIC: Radio San'a. Arabic. Middle Eastern music to clear ID at 2100. International news, Holy Koran recitations and anthem to 2109 sign-off. (Robert Landau, Secaucus, NJ)

2052 UTC on 15046

PIRATE: Samurai Radio. Pop music and address given as "P.O. Box 628, Slanesville, WV 25444." Station sign-off at 2057 UTC. DJ also gave frequency quote of 6200/6245 kHz. Signed back on at 2157 UTC. (Harold Frodge, Midland, MI)

2059 UTC on 7290

IRAQ: Radio Baghdad. Arabic. Sign-on with ID and closing anthem. National newscast at 2103 UTC amid heavy amateur radio transmissions. (Stephen Price, Conemaugh, PA) Monitored on 15400 kHz at 1745 UTC. (Kannon Shanmugan, Lawrence, KS)

2102 UTC on 15045

PIRATE: Voice of the Purple Pumpkin. Station ID "You're listening to the original, the one, the only Voice of the Purple Pumpkin broadcasting from the Purple Valley." Beatles and pop oldies to 2129 UTC. Station sign-off at 2141 UTC, followed by a sign-on from pirate Samurai Radio. (Harold Frodge, Midland, MI)

2105 UTC on 9950

SYRIA: Radio Damascus. Close down with news headlines and ID as "This is the broadcasting service of the Syrian Arab Republic Damascus Radio." Parallel 12085 kHz heard with poor signal quality. (Stephen Price, Conemaugh, PA) Monitored on 12085 at 2013. (Tim Jonnson, Galesburg, IL)

2140 UTC on 9700

BULGARIA: Radio Sofia. "Spectrum" program features reports on Sofia's botanical gardens and the oldest national puppet theater. (Bob Fraser, Cohasset, MA)

2300 UTC on 15180

USSR: Lithuania. Radio Vilnius. National news and letters from listeners. Program feature on the history of Lithuania to 2327 sign-off. Heard on 7400 kHz at 2258-2309 UTC. (John Carson, Norman, OK)

2331 UTC on 7410

PIRATE: Voice of the Abnormal. Wolfman Jack type announcer with lots of yelling and Peter Lorre skit. Sign-off at 2347 UTC. No address given for this broadcast. (Harold Frodge, Midland, MI)

2335 UTC on 11825

ALBANIA: Radio Tirana. Discussion about Albanian socialist economy. Excessive interference from VOA sign-on at 2343. (John Carson, Norman, OK) Monitored on 9760 kHz at 2330 UTC. (George Neff, Lutz, FL)

2349 UTC on 4899

GUINEA: Radiodiffusion Nationale. French. African highlife music to "Ici Conarky" ld, newscast and music to anthem at 2359 UTC. (Sam Wright, Biloxi, MS)

Utility World

Larry Van Horn c/o MT, P.O. Box 98 Brasstown, NC 28902

A Special Message to Shortwave Broadcast Listeners:

If you're like most shortwave listeners, hearing a new country is something of a thrill. Shortwave broadcast listeners, for example, have their share of rare and exotic targets to hear. Unfortunately, many of these can be found only on the lower frequency bands and that means that as spring approaches, these stations become harder to hear. Utility listeners don't have this problem.

The bottom line is -- and I am admittedly biased in favor of utility DXing -- that the Utility World offers more exotic targets for the country chaser than the broadcast bands do. When was the last time you logged, much less verified, Amsterdam and St. Paul Islands, Antigua and Barbuda, Bahamas, Bahrain, Barbadoes, Bermuda, Bhutan, Diego Garcia, Canary Island, Cape Verde, Caroline Islands, Cayman Islands, Christmas Island, Cocos (Keeling) Islands, Comoros, Cook Island, Dominica, Easter Island, Falkland Islands, Fiji, Gibraltar, Greenland, Grenada, Hawaii, Hong Kong, Howland Island, Iceland, Ireland, Jamaica, Jarvis Island, Johnston Island, Kerguelen Island, Madeira, Niue Island, Phoenix Island, Pitcairn Island, Puerto Rico, Reunion and dependencies, St. Christopher and Nevis, St. Helena, St. Lucia, St. Pierre and Miquellon, St. Vincent and the Grenadines, Samoa (American and Western), Singapore, Solomon Islands, Turks and Caicos and Tuvalu?

One well-known and very hard-core shortwave broadcast DXer has recently set his hand to utility DXing. I won't use his name here for fear of reprisals from his broadcast DX buddies, but this gent who is one of the best around. And he has been listening to the utility bands and liking it. To quote him, "It was nice to hear Djibouti and Khartoum working aircraft on 11300 since I no longer hear them on the shortwave broadcast bands."

Well, shortwave listeners, is your mouth watering yet? A lot of these targets are easy to hear (anytime of the year and on more than one frequency at a time) and yes, they do verify correct reception reports.

Look over some of the loggings in this month's column. Put the headphones back on and give utility band DXing a whirl of your radio dial and "Try it, you'll like it."

Plain White Envelopes in the Mail

I get nervous when a plain white envelope with no return address comes in the mail. It could be from anywhere: bill collectors, the IRS, the CIA maybe.

Recently, I received one of these terrifying plain white envelopes at the house. This time, however, it was a good one. Where did it come from? The stamp wasn't even cancelled so I couldn't tell. But after carefully opening the envelope, inside I found one sheet of paper, typed and unsigned. Boy, was this one interesting piece of paper.

To whoever sent this, I understand and appreciate you

taking the time to send it. SAC and Navy monitors pay attention, this is for you and I am only going to print this once. This is what the piece of paper had written on it:

JCS EMERGENCY ACTION MESSAGES

"Larry, you have mentioned these broadcasts many times in your column and loggings as broadcasted by SAC and the Navy. Thought you would like to read what the company policy says about these EAM broadcasts."

"JCS (Joint Chiefs of Staff) Emergency Action Messages (EAMs) contain key instructions or information from high-level authority and have predetermined formats (pro forma). Such messages are transmitted by various communications systems and normally carry FLASH precedence. They are vital messages of an extremely time-sensitive nature, and rapid processing is mandatory to obtain the fast reaction required by their content. Usage and handling procedures are of higher classification and have been issued by the JCS to those who have a need to know."

Well, to whoever sent this, thanks, even if it did come in a plain white envelope. The next time you are monitoring a SAC or Navy frequency and hear the operator repeating: "Alpha Six Charlie Two, I say again..." remember, you are listening to an EAM and you might want to keep the above statement in mind.

Bill Brinkley was surprised to note my surprise about the McClellan GCCS frequency of 10.112 several months ago. Bill says that McClellan has used Mystic Star (VIP/Presidential HF network) frequencies for over a year now for "discrete frequencies" for high traffic and highranking flights like "Head Dancer" and some SAM (Special Air Missions -- VIP) flights. The following frequencies have been used:

6730 6760 6780 7997 8050 8992 9320 (often) 10112 (often) 11035 11156 11249 11413 18060

Hickham is also on the bandwagon by using 18146 for Head Dancer flights. Bill believes that Andrews uses the USAF GCCS stations such as McClellan as relay stations. They backhaul the comms to Maryland via land line. If the lines are down, the station can come and give AUTOVON connections to Andrews.

Thanks, Bill, but I am still surprised, as I didn't realize what was going on here. Appreciate the update on the USAF Global Command and Control Station at McClellan and I am sure our readers do, too.

Another Convert Wants Info

"I am a retired USAF-06 and was Chief-US Mission in



SAC Photo

JCS Emergency Action Messages are of an extremely timesensitive nature and carry a higher classification ... Pictured is General Bennie Davis, Emergency Action Officer during an actual mission.

Colombia and Commander-USMAAG-Peru through 1981," says John Smitherman, a supporter of my wife Gayle's shortwave loggings column, who lives in Gainesville, Florida.

John says, while he was "down there, I talked with the world, the US in particular, on my Collins equipment."

"Panama usually acted as our relay point and did our patches to everywhere," Smitherman said. "At Lima, we were OAE21 and Panama was AHF4." Well, John got to wondering, "Can I possibly pick up those transmissions in Gainesville? If anybody knows, I'm sure it is you, Larry," said our new convert.

Well, John, thanks for the vote of confidence. I would be interested in talking to you about this further so feel free to drop me a line about this net sometime. Meanwhile, back at the USMAG, here's the scoop. The USMAG net in Latin America is alive and well. They are operating pretty much daily on several frequencies and still running phone patch traffic for embassy and military attaches throughout Latin America.

The exciting part about this net is you just never know what you are going to hear. During the Panama invasion, this net was very active with some real neat stuff. Even as I speak, some discussions about the US Navy-Colombia-and Drug interdiction is going on. This is just a great place to hang out when something is happening in Latin America.

The frequencies to check out are as follows:

3503	Channel 1
7430	Channel 2 Night Primary
10935	Channel 3
13937	Command
13950	Channel 4 Day Primary
20885	Channel 5 Day Secondary

As John pointed out, this is quite an extensive network. Stations in embassies throughout Latin America utilize the frequencies above. Below is a list of the current call signs heard on the net:

AHF4	Howard AFB,	Panama
LOU21	Buenos Aires,	Argentina

VPL1D5	Belize City, Belize
CPP67	La Paz, Bolivia
CEF5U1	Santiago, Chile
5KO225	Bogota, Colombia
ACB	Rio de Janeiro, Brazil
TI2USA	San Jose, Costa Rica
HIP491	Santo Domingo, Dominican Republic
HCUS1	Quito, Ecuador
YS1HUKE	San Salvador, El Salvador
TDMG3	Guatemala City, Guatemala
ACH54	Port-Au-Prince, Haiti
HR1MN	Tegucigalpa, Honduras
YN1AFM	Managua, Nicaragua
ZPM261	Asuncion, Paraguay
OAE21	Lima, Peru
CXC20	Montevideo, Uruguay
YWA6	Caracas, Venezuela
AHF1B	Unidentified, has been heard airborne
AHF1A	Unidentified, possibly El Salvador
AHF5	Unidentified, possibly Panama
TGHM1	Unidentified, possibly Guatemala

John, I hope this helps, and any information about this network you can share, or a point of contact down there, would be appreciated. Thanks for the letter, and welcome to the "Utility World."

Speaking of Embassies

Monitoring Times' own RTTY columnist, Jack Albert, has contributed the following new embassy frequencies for RTTY equipped stations:

Egyptian Embassy, Washington, DC 11240 kHz ARQ mode US State Department, Washington, DC 14638 kHz 425/75 RTTY

Thanks, Jack, and as always we appreciate you checking in with your RTTY intercepts. Speaking of digital modes, Bill Buchsbalm in Okinawa is hooked on digital modes.

"Multi-mode controllers such as the AEA PK-232 should carry an addiction warning," he says. "I have spent the last four days chained to my radio gear."

Bill is using a shack full of equipment over on Okie Rock and as the following intercepts confirm, it's working well for him.

RJTD-Tokyo, Japan, weather RTTY 50 baud almost continuous

5102.4	Similar to 3670.2 but not continuous
6433.5	Unid RTTY 50 baud passing four-letter groups
6915.2	Xinhua (China) News Service with English news at 1030
7863.2	Another five-figure group weather RTTY channel 50 baud
9458.9	Unid CW station sending typhoon warning South China Sea
10168.2	Another five-figure weather RTTY station Korea/Japan
10523.5	North Korean news service in French at 1310 RTTY
11520.0	Another five-figure weather RTTY station Korea/Japan
11536.0	North Korean news service in French at 1321 RTTY
13563.0	3MA22-Central News Agency, Taiwan, with reference other operating frequencies 10235, 13563, 7695, 16224, 10960
14367.0	Xinhua news service in English RTTY
14547.5	Kyodo news service, Japan, with Asian sports news RTTY
14595.0	Kyodo news service with English news
16384.0	XVN43-Vietnam news service with French news, also 13372
20960.0	Kyodo news service with English news and sports RTTY

Thanks for the list, Bill, and I hope to hear more from Okie Rock in the future. Now it's time to see what you, our readers, have heard this month in the utility world . . . till next month, good DX and 73.

3670.2

Utility World

Utility Loggings

Abbreviations used in this column

	iglish unless otherwise no		
AM	Amplitude modulation	ISB	Independent sideband
ARQ	SITOR	LSB	Lower sideband
CW	Morse code	RTTY	Radioteletype
FAX	Facsimile	UNID	Unidentified
FEC	Forward error correction	USB	Upper sideband
ID	Identification		

- 4369.8 WLP-Rodgers City Radio, Michigan, at 0256 in USB with weather report. (Dix, NY)
- 4448.5 Group Key West working USCGC Taurus and others on channel 3alpha 4, at 1356 during SAR south of the Florida Keys. Switched to 7773.5 as primary due to interference on frequency. (Larry Riffle, Key West, FL)
- 4562.5 JWT-Stavanger Radio, Norway, at 2356 with V CW marker. (Dix, NY)
- 4670.0 Victor-Lima-Bravo-Nine station heard at 0252. (William J. Burghardt, NJ) This is an Israeli Moshad station.-ed.
- 5020.0 Single letter HF beacon -- "K" in CW right atop Radio Moscow. (William J. Brinkley, Belmont, CA)
- 5422.5 Group Key West working Lighthouse Dry Tortugas on channel 3 alpha 3 at 0015 requesting latest info on Yugoslavia cargo ship Marvo Vetranic grounded on a coral reef. (Riffle, FL)
- 5696.0 CG Airstation San Francisco working CAMSPAC advising that phones are out and that CG 1480, 2129, and 1480 are on the scene with ops normal at 0134 in USB. Also CG 1496 calling COMSTA Miami with Mayday at 0029. (Helo crashed into the water, no injuries but they need immediate assistance-CG 1717 enroute) in USB. (Battles, NH)
- 5700.0 Monitored a slow "Skyking" like broadcast in USB at 1332. (Fraser Bonnett, Kettering, OH)
- 6287.0 95TMW working 98HRS at 0027 in CW. (Dix, NY)
- 6518.8 USS Dwight D. Eisenhower working NMN-Portsmouth, Virginia, at 2052 in USB. (Battles, NH)
- 6577.0 Teal 57 heard in USB working Piarco (Trinidad) with position report over 16.3N 57.2W and estimating Barbados at 0815. Aircraft from the 815th Weather Recon Squadron out of Keesler AFB, Mississippi. (Garie Halstead, Saint Albans, WV)
- Spanish female four-digit number station heard at 0224. (Dix, NY) 6719.9 4ZY working B6W and V0L working B6W at various times in USB. (EM3 Doug Graham, Virginia Beach, VA) Welcome to Ute World, Doug, nice to see a fellow swapee here.-ed. (alias the Chief.)
- 6817.0 Andrews AFB working Air Force One advising "We are having a shortwave phase up to 15 MHz for the next 30 mikes" heard in USB at 1326. (Battles, NH) ???-ed.
- 6943.0 RGZ44 called by UDH33 in CW at 0112. (Dix, NY) Obviously these stations are Russian, but I have nothing else on them, Jack. ed.
- 6968.5 NNNOZTT at 2315 controlling Region 2 Navy MARS traffic net in USB. (Joe Doakes, 100 J. Klingenfuss Drive, Mars, PA) Welcome back, Joe-ed.
- 7480.0 BAW calling COB and sending V's in CW at 0124. (Dix, NY) My guess, Jack, is that these stations could be from Cuba and China. Anybody else-ed.???
- 7635.0 Empire 529 working Northeast 40 and exchanging info on thermal printing at 0128 in USB. (Dix, NY)
- 7763.0 English female four-digit number station at 0134. (Dix, NY)
- 7773.5 COMSTA Miami working USCGC Padre and others on channel 3 alpha 8 at 1415 during SAR for missing Customs officer aboard downed Blackhawk helo near 23.5N 80.3W. Used 381.0 UHF for a/c to a/c comms during SAR. See 4448.5. (Riffle, FL)
 - Cutters Dauntless, Hamilton, Bear, Nunivac, and many others with COMSTA San Juan, Portsmouth, and Coast Guard Mobile Central 4 heard at 0259 in USB. Used frequency over a week. (Bill Frantz, Thomasville, GA)
- USCGC Bear working ships near San Juan, Puerto Rico. (John Klaff)
 7831.0 Bird Song working WAR-46 with Autovon phone patch to Offutt
 Headquarters in USB at 0106. (Believe this was a Looking Glass
 aircraft due to the QSO I monitored, talking with National Command
 Authority). (Battles, NH)
- 7952.0 UHF3-Yeyskstaro Radio, USSR, transmitting standard meteo coded CW messages at 0143. (Dix, NY)
- 8185.0 ASCOT 5523 working Portishead Radio (UK) with SELCAL check in USB at 0204. (Battles, NH)
- 8294.2 WFZ-Morgan City, Louisiana, clearing with the augusta in USB at 2116.

- (Neal Perdue, Madison, AL)
- 8456.0 ROT-Moscow Naval Radio, USSR, sending a CW CQ marker at 0313. (Dix, NY)
- 8459.0 YDI-Constanta Radio, Romania, heard at 0101 with a CQ CW marker. (Dix, NY)
- 8474.0 HCG-Guayaquil Radio, Ecuador, at 0124 with V CW marker. (Dix, NY)
- 8485.0 4XO-Haifa Radio, Israel, with a CQ CW marker at 0124. (Perdue, AL)
- 8486.0 IDQ-Rome Naval Radio, Italy, at 0055 with CW marker. (Dix, NY) 8542.0 PKX-Jakarta Radio, Indonesia, at 1026 with CQ CW marker. (Dix, NY)
- 1500 5 Comment Comment
- 8562.5 German female four-digit numbers station at 0611. (Dix, NY)
- 8567.0 XDA-Mexico Radio, Mexico, with CQ CW marker at 1015, sloppy fist. (Perdue, AL)
- 8610.0 UXNB-Arkhangelsk Radio, USSR, at 2355 with DE CW marker. (Dix, NY)
- 8619.0 VRN-Cape D'Aguilar Radio, Hong Kong, with DE CW marker at 1057. (Dix, NY)
- 8655.0 UAI3-Nakhodka Radio, USSR, heard at 1100 with a V CW marker. (Dix, NY)
- 8690.0 3DP2-Suva Radio, Fiji, at 0929 in CW with CQ marker. (Dix, NY)
- 8825.0 Santa Marie Radio at 2345 directing flights to Caracas, Venezuela, to use the following route across the Atlantic Ocean: 35N 17W, 33.3N 20W, 28N 30W, 21.2N 39.3W, 21N 40W, 17.45N 45W, 13.5N 56W at 31,000 feet at mach .82. (Doakes, PA)
- 8855.0 Eastern 010 heard in USB at 0623 working Maiquetla with position report over ISANI. Estimating Canaima at 0640. (Halstead, WV)
- 8866.0 Unid stations at 0111 in USB using call signs like 607C/098F/134D plus dozens more. All in English with some in Spanish accents. One made comment "Good luck to you and all of us." If this a pirate fishing fleet, they are pretty big. (Doyle, CT)
- 8891.0 Reykavik, Iceland Aeradio working Gander Aeradio in USB at 0144. (Perdue, AL)
- 8903.0 ATC Brazzaville, Congo, working Speedbird 55 in USB at 0047. (Dix, NY) ICAO AFI-4-ed.
- 8918.0 New York Oceanic working several flights due to stuck mic on 8846.0 in USB at 1921. (Battles, NH)
- 8968.0 Mobil 2 working Youngstown with a QSO about a laptop computer working better than the expensive Motorola gear. (I believe these were USN units) in USB at 1925. (Battles, NH)
- 9006.0 Cape Radio working MAC 185 in USB at 2358 with phone patch. Trenton Military came up on frequency with the following announcement, "This is a CANFORCE Canadian military frequency only" -- Cape Radio moved to 10780. (Battles, NH)
- 9023.0 WHX-45 working KLB-70 with a QSO in USB at 1738. (New call signs here -- anybody have any ideas?) (Battles, NH)
- 9124.0 Dragon Metro working Mountain Metro in USB at 1355. (Anybody know who this is?) (Battles, NH)
- 9130.0 Unknown accented female with five-letter groups at 2214 (Friday) in USB. At 2224, "end of message, end of transmission." (Doyle, CT)
- 9180.0 Radio Moscow feeder in USB transmitting English world service then into an unid language at 2330. (Robert Confino, Douglasville, PA)
- 10194.0 Various FEMA stations heard at various times in USB. (Klaff)
- 10295.0 FSB-Paris, France, Interpol with CW marker at 2355. (Doyle, CT)
- 10478.0 NB calling EX and DC at 2313 in USB. Told all stations standby for radio check. These stations were weak, then YC came on for a radio check, he was strong. (Doyle, CT)
- 10493.0 Various FEMA stations heard at various times in USB. (Klaff)
- 10780.0 India 9 India working Uniform 1 Echo with clear and green comms in USB at 0029. (Battles, NH) Definitely USN probably associated with ballistic missile test off the Cape, Bill.-ed.
- 11007.5 Trenton Military working Century 50 with phone patch traffic to Raymond 24 (Tinker AFB, OK) at 1603 in USB. (Battles, NH)
- 11154.5 Single letter HF beacon "K" in CW. (Brinkley, CA)
- 11176.0 USAF GCCS Albrook, Panama, setting up phone patch for >>>> Federal Express Flight 5 <<<< (a collect call) to "somewhere near Memphis Naval Air Station"; Fedex 5 passed coded info as well as fuel/position/estimated ground time; crew indicated that "we were working our tails off down there" at 0135 in USB. (Could this have been the US-Colombian anti-drug airlift?) (Confino, PA) Probably so, Robert-ed.
- 11191.0 Hershey (NAS Key West) working Mona Lisa and Gangster in the clear and secure at 0230 requesting radio checks. (Riffle, FL)
- 11222.0 American 37 working Stockholm Radio testing SELCAL in USB at 2145. (Battles, NH)
- 11244.0 LHT8 calling KOVD in CW at 2322. (Dix, NY) Anybody know who these stations are, also note KOAT and others.-ed.
- 11267.0 Two unidentified USN units advising that "The fire is out" in USB at 2358. (Battles, NH)

30

11295.0 FSB-Paris (St. Martin Abbat), France, Interpol station with ARQ idler and CW call sign ID at 2324. (Dix, NY)

11300.0 Seychelles ATC receiving flight info regarding aircraft flight from Abu Dubal from Nairobi ATC at 0040 in USB. (Dix, NY)

11359.0 RFNV-Moscow Air, USSR, at 0119 in CW transmitting METAR Info. (Dix, NY)

12210.0 German female 5/4 digit number station heard at 0012. (Dix,NY)

12246.0 Cape Radio attempting phone patch for MAC 185 but frequency not receivable at 2354 in USB. (Battles, NH)

12254.0 P7X with a QRA CW marker at 0019. (Dix,NY)

12560.0 Fishing fleets discussing sea conditions, catches. Jamaican accents and Jamaican locations in USB at 1430. (Frantz, GA)

12653.0 CBV-Valparaiso Naval Radio, Chile, at 0130 with a CQ CW marker. (Perdue, AL)

12686.0 PKE-Amboina Radio, Indonesia, heard at 1118 sending a CW CQ marker. (Dix, NY)

12781.0 TAH-Istanbul Radio, Turkey, sending a DE CW marker at 0353. (Perdue, AL)

12887.5 EAD44-Aranguez Radio, Spain, with CW ID at 0427. (Perdue, AL)

12924.8 UDK2-Murmansk Radio, USSR, sending CW telegrams in Russian at 0004. (John DeCarter, Fayetteville, NC)

12947.0 UFB-Odessa Radio, USSR, at 0103 working 4KA in CW. (Dix, NY)

12961.0 GXH-Thurso Naval Radio, Scotland, in CW with LCMP-2 broadcast at 0105. (Dix, NY)

12967.0 A6A with B6B and K6M66 conducting military-type radio checks, maintenance reports, etc. Another group with similar IDs heard on 12970 in USB. Both stepping on each other. (Frantz, GA)

13047.0 SVA-Athens Radio, Greece, heard at 0409 in CW with a DE marker. (DeCarter, NC)

UAI3-Nakhodka Radio, USSR, at 1101 with V CW marker. (Dix, NY) 13205.0 Cathay 289 working Universal Radio requesting weather forecast for Frankfurt and other German cities in USB at 2330. (Battles, NH)

13244.0 Gull 27 working MacDill GCCS at 1553 in USB. Gull said "The Russians are flying today using the ID Aeroflot 5333." (J.R. Miller, Ariss, Ont, Canada) Welcome aboard, JR, hope you report often.-ed.

13247.0 Andrews AFB, Maryland, working SAM 203 in USB at 2315. SAC units Deep Cut and Pure Gold came up on frequency and were told to find a new frequency by Andrews. (Guess we know who has priority!) (Battles, NH) You are right, Bill, I heard Air Force One run some SAC command post off this frequency when they were up.-ed.

Venus 7 working Head Shop in USB at 1927 requesting secure voice check with diversity added to the signal (sounded like DOE transport type audio). (Battles, NH)

Whisker 50 calling McClellan. MacDill answered and initiated a phone patch to Discard only after Whisky 50 gave its full tail number. (Bonnett, OH)

13254.0 Sierra Zero Delta working Halifax Military with EAM type coded message in USB at 2018. (Battles, NH)

13291.0 New York Aeradio working SAM 60202 at 2132 in USB. (Doyle, CT)

13306.0 Speedbird 255 working Santa Marie Aeradio with a position report in USB at 1750. (DeCarter, NC)

13630.0 Various FAA stations heard at various times. (Klaff)

13996.0 Various Red Cross stations heard at various times. (Klaff)

14450.0 WGY 917 (St. Croix) working WGY 912 (Mt. Weather, VA) and WGY 901 (Maynard, MA) FEMA unit 917 on scene of hurricane disaster. 901 was in his car running phone patches with 912. SATCOM downlink was 263.575 but intermod problems due to so many emergency transmitters up in the same area. At 0247 in USB. (Another FEMA station heard on 5211.) (Battles, NH)

14686.0 Ambush working Atlas (DEA) in USB at 1452 with phone patch to Warrior Personnel. (Battles, NH)

14928.0 8BY-Unid station heard at 1645 in CW with: VVV de 8BY/034/623/716/473/967. Who? (Dix, NY)

15015.0 Bear 91 working USAF GCCS Albrook with phone patch to Aficanno? Air Base Honduras at 2110 in USB. (Battles, NH)

15031.0 Bison 07 Bravo working Trenton Military requesting a weather report in USB at 2201. (Battles, NH)

15044.0 Foxtrot working Kelly 1 and Kelly 3 with data test in USB at 1947. Boxcar 1 working Quixote in USB at 2356 advising that 1100 Airborne MPs arrived and "We're very crowded down here (believe in St. Croix). (Battles, NH)

15048.0 Agar 18 working OTH Backscatter requesting a chirp at 30 MHz in USB at 1504. (Battles, NH) Now that is unusual, Bill.-ed.

16870.0 RIT-Moscow Naval Radio, USSR, in CW with "VVV RMAT de RIT QSA 1m1k." (Dix, NY)

16887.5 SPH41-Gdynia Radio, Poland, heard in CW with CQ/QSX marker at 1823. (Perdue, AL)



17013.0 5BA-Nicosia Radio, Cyprus, heard in CW at 1530 with a CQ marker. (Dix, NY)

1-800-438-8155 VISA, MC, COD

1-704-837-9200

17079.0 HLF-Seoul Radio, South Korea, heard at 1150 with a CW CQ marker. (Dix. NY)

17184.8 9YL-North Post Radio, Trinidad at 1205 with CQ CW marker. PKE-Amboina Radio, Indonesia, at 1209 with CQ CW marker. (Dix, NY)

18012.0 CRW 315 working Trenton Military in USB at 1614 with phone patch to company ops in Toronto. (Can't picture a USAF GCCS doing this for our commercial flights) CRW is Crown Air in Toronto, Ontario. (Battles, NH)

18171.0 Various US Customs stations heard at various times. (New/special channel?) (Klaff)

18594.0 Omaha 07 working Ambush in USB at 0007 (Customs on a former SAC channel!!!) (Battles, NH)

19757.0 Various FEMA stations heard at various times here on channel Fox-46. (Klaff)

20284.0 SPW-Warsaw Radio, Poland, at 1626 with DE CW marker. (Dix, NY)
 20890.0 Omaha 68 working Slingshot in USB at 1958. (Customs again on another SAC channel). (Battles, NH)

21964.0 Honolulu Aeradio working various aircraft over the Pacific at 0000 in USB, secondary frequency was 13273. Numerous responses heard from aircraft, several turned over to Tokyo on 133.7 or 133.73. (Burghardt, NJ)

22312.0 A9M-Bahrain Radio at 12213 with DE CW marker. (Dix, NY)

22382.0 KOAT calling HKMR in CW at 1123. (Dix, NY)

22386.0 JCT-Choshi Radio, Japan, at 2310 with a CQ CW marker. (Dix, NY)

22422.0 UVA-Unid USSR sending CQ CW marker at 1504. (Dix, NY)

22435.0 UFL-Vladivostok Radio, USSR, heard at 0133 with a CQ CW marker. (Dix, NY)

22474.0 VIS3-Sydney Radio, Australia, at 0150 with V CW marker. (Dix, NY)

22452.0 XSD-Guanozhou Radio, China, at 0146 with CQ CW marker. (Dix, NY)

22463.0 JCU-Choshi Radio, Japan, with CQ CW marker at 0135. (Dix, NY)
22583.0 ZLB-Awarua Radio, New Zealand, with DE CW marker at 2346. (Dix,

NY)

23312.0 ASM-Bahrain Radio, Bahrain, with a CW De marker at 1920. (Dix, NY)

Brasstown, NC

28902

The Scanning Report

Bob Kay c/o MT, P.O. Box 98 Brasstown, NC 28902

Monitoring Mobile Data Terminals

Concealed within the darkness of an abandoned warehouse, two drug dealers were discussing the details of their next illegal shipment. Hiding within thirty feet of the two men, a Federal Drug Enforcement Agent watched and listened.

Having missed his check-in time by 20 minutes, the DEA agent realized that if he didn't call in soon, other agents would storm the building and ruin his chance to hear some very valuable information.

Unable to use his two-way radio, he pulled a gadget from his pocket that resembled a small calculator. After pressing the "on" switch, a lighted LCD display silently blinked the word "ready." Within seconds after entering his access code, he was connected to the main computer at DEA headquarters. On the dispatcher's console, a small computer screen suddenly displayed the following message: "Agent #2, okay. Must maintain radio silence."

"He's okay!" the dispatcher immediately yelled. "He checked in on his portable data terminal."

Does the above scenario sound as if it belongs in a future time? Actually, it could have happened last year. It was June 1988 when Motorola introduced the KDT 840. The unit is a hand-held data terminal that contains a miniature FM transmitter and receiver. In some states, police officers are using the KDT 840 to perform routine license and vehicle ID checks.

After the information is correctly keyed in, the officer presses the "send" button and the data is then transmitted to a main computer. As the main computer locates the information, it simultaneously alerts the dispatcher of the location and nature of the patrol officer's request. A few seconds later, the main computer relays the data back to the hand-held data terminal and the patrolman writes out the ticket. The entire process is accomplished without voice communications and without assistance from the dispatcher.

As you read this, I know what you're thinking. "Can these data channels be decoded?" If you are referring to decoding equipment that can be purchased off the shelf, the answer is "not yet."

The majority of mobile data terminal transmissions are not encrypted. The terminals are designed to simply provide wireless data communications between field personnel and a central computer. When used for law enforcement, mobile data terminals are generally assigned to an existing police frequency. This frequency is commonly referred to as a "data" channel.

To help you understand how portable data terminals function, let's look inside Motorola's KDT 840. The KDT 840 features a 160 character backlit LCD display. The unit is battery powered, contains an FM transmitter and receiver, an internal antenna and weighs less than 30 ounces. As already mentioned, the unit can store up to 96 K of downloaded information from a host computer.

In the cities of New York, Chicago, and Los Angeles, Motorola data systems are supported by a network of antennas and repeater sites that allow the KDT 840 and similar Motorola products to be accessed from anywhere within city limits. The system is referred to as Motorola's "Data Radio



Can mobile data terminals be monitored? Bob Kay thinks you can; however, he needs your help.

Network."

The KDT 840 sends information in standard ASC computer format. The information is sent in "bursts." A more common name for this type of emission mode is "Packet Communications." Some of you probably realize that ham radio buffs have been using "packet radio" for several years.

The stumbling block to capturing and decoding the KDT 840's signal is the sending speed. Most computers are made to handle baud rates between 300 and 1200. The KDT 840 has a baud rate of 9600. Although that is rather fast, it wouldn't be impossible to produce a program that would make the transmission accessible to a home computer.

The idea of monitoring mobile data terminals on a home computer has also intrigued *Monitoring Times* publisher, Bob Grove. When I contacted Bob, he confirmed my findings and agreed with the idea of developing a software program. Bob further explained that the hobbyist would need to connect an interface between the scanner and the computer.

After checking the market, I found that several manufacturers had already produced a scanner interface for the ICOM R-7000. If I had a program specifically designed for mobile data terminals, I could have given it a try. Without such a program, it was impossible to continue.

If you are thinking about designing a custom program, there's one more problem that should be considered. Data terminals from different manufacturers are not compatible. A G.E. terminal would not work on Motorola's Data Radio Network. That would seem to indicate the need for separate software packages for each manufacturer.

As you begin to explore the data frequencies in your area, don't keep your trials and errors a secret. If you send your findings to the "Scanning Report," I'll do my best to sort through the information and to take a crack at solving mobile data monitoring. But I can't do it alone. It would take years for me to discover the information that you guys could provide in a matter of days.

It doesn't matter if you're a software engineer or just a "tinkerer." Everyone is invited to send in their findings and questions. Unless you request anonymity, I'll make your letter available to other hobbyists who are also trying to monitor data terminals. And for a #10 SASE, I'll provide you with an updated progress report. So don't just sit there, let's explore the data frequencies and find out what we've been missing!

MT Treasure Hunt

Are you interested in winning a pocket-size battery-operated tape-saver device? If so, Capri Electronics has provided two of their "ScanRecords" for the March/April Treasure Hunt.

The ScanRecord features a small beige-colored plastic case about four inches long, two inches wide, by two inches deep. The front panel incorporates a dial control for adjusting sensitivity, a red LED indicator, and a toggle switch for controlling the delay time.

After making an hour-long recording from a PRO-2004, the quality of the taped conversations was flawless. One of the most unique features on the ScanRecord was the addition of an A/B switch that totally eliminated the need to remove the control cable from the recorder. Simply flip the switch and the tape player could be manually operated.

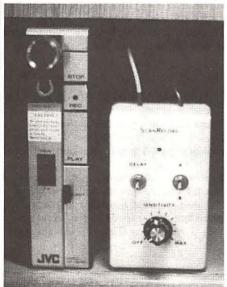
The solid state construction of the ScanRecord was another pleasant surprise. Since a contact relay wasn't used, the switching operation was completely silent -- a nice feature if you're making a recording in the same room where you are sleening

With a 9-volt battery installed, the ScanRecord became completely portable. When accompanied by a hand-held scanner and pocket tape recorder, the hobbyist can easily make recordings at emergency scenes, air shows, or during camping trips.

The ScanRecord does not have an internal speaker or volume control. To hear the action while recording, simply use a dual-jack adapter with an ear phone or extension speaker.

Priced at \$47.00, the ScanRecord is the most moderately priced and most desirable tape-saver device on the market. To order your very own ScanRecord, contact Capri Electronics, 1238 Highway 160-B, Box 589, Bayfield, Colorado 81122, or call 303-884-9084.

Short on cash? No need to worry. Simply send in the answers to the following clues and keep your fingers crossed:



This batteryoperated tape saver device will be yours if you win the new treasure hunt!

- 1. In the December '89 Scanning Report, name the fourth company listed in the "Christmas Wish List."
- Can cellular coverage be restored to Radio Shack's PRO-34? Yes or no.
- 3. What is the channel spacing on VHF low band?
- 4. In the November '89 issue of MT, there is a hidden scanning article that is not mentioned in the index. What is the title of the article?
- For VHF/UHF monitoring, which cable exhibits the lowest loss per foot: RG 58/U or RG-6?

Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. To have your answers verified, please include an SASE. Incorrect entries will be discarded.

Frequency Exchange

Rodger West is a disabled scanner buff who has sent in over 600 frequencies for northwestern Wisconsin and eastern Minnesota. Here is a sample:

NW WISCONSIN/E MINNESOTA

151.010/156.015	Wisconsin snow plows
151/265	Minnesota DNR fire spotting planes
151.415	DNR statewide repeater
156.000	Wisconsin emergency government repeater
163.410/164.500	Locks and Dams
164.250	Croix River National Scenic Riverway and Park
171.575	Minnesota State Patrol aircraft
408.675	Croix River National Riverway portables

During the winter months, Rodger is a "shut in," and would appreciate swapping frequencies with other readers. To contact Rodger, simply write to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

If you're a railroad fan and live near Thorton, Colorado, I've got a page of confidential frequencies for the Rocky Mountain Railroad. The frequencies were submitted by a railroad detective who has asked to remain anonymous.

To receive the list, just send an SASE to the Frequency Exchange. That's right, it's free! But don't delay. Letters postmarked after March 31st must include a buck to cover copying and handling costs.

Here's a peek at what I have:

ROCKY MT. RAILROAD

7		
	160.245	Mobile phone (PBX-2) Cheyenne Mountain
	160.335	Mobile phone (PBX-4) North of Monument Hill
	161.370	Dispatcher link Frick and LaJunta
	161.490	York Canyon
	160.575	Mechanical Department
	452.825	Dispatcher link Sherman Hill

Another "secret" scanner listener from Colorado wrote in to say that he hasn't been able to monitor the A-7s that fly out of the Buckley ANG base.

Can anyone help out? In exchange for your help, our secret listener has provided the following list:

BUCKLEY ANG

Buckley ANG A-7s -- "Redeye" Buckley ANG Helicopters -- "Outlaw" Air Force 737s (T43) for navigator training -- "Bobcat" Tower 121.0/289.6 Ground 121.6/275.8 App/Dep 119.3/307.3 Opns 372.2 Range Ctl 287.3 "Airburst" VIP Notification Lowry AFB Command Post 253.625 Ramp CTL 148.215 DOD Police 148.625 173 075 Crash Base Cdr 148.325 Ordinance 148 515 Fueling 148.45 MPs 150.225 173.5875 Fire Dept Base Trans 149.205 Tactical Special Use 268.1 381.4 296.7 (Usually AM, may be NFM, or WFM voice mode) Used for intercom channel between A/C in a cross 303.0 country flight ANG A-7s air to air 32.75 ANG Helicopters air to air 32.85 ANG A-7s air to air 36.45 ANG A-7s air to air 41.45 ANG A-7s air to air ANG Helicopters Ops 41.75 Air/Air/Ground ANG Helicopters 142.40

Ready for a change of climate? Let's visit with Laura Quarantello. Laura lives in San Diego and sent in the following:

SAN DIEGO, CALIFORNIA

453.925	SD Sheriff-North
453.500	SD Sheriff-East
453.950	SD Sheriff-South
453.750	SD Sheriff-Coast
154.310	SD Fire Dispatch
153.785	SD Fire Rescue Paramedics
154.235	Rancho Fire Dispatch
154.025	City of Escondido Police
154.325	City of Escondido Fire Dispatch
151.190	California Department of Forestry
168.750	Cleveland National Forest
462.975	Lifeflight Air Rescue
453.200	SD Wild Animal Park Security
453.800	SD Wild Animal Park Monorail
151.895	SD Zoo Security
151.460	SD Zoo Maintenance



464.425	SD Zoo Security, primary
461.725	Checkmate Protective
461.725	NCI Protective
461.825	Pinkerton Security
151.715	Vista Patrol
45.700	Animal Regulations Office
45.900	Animal Regulations Office
155.820	Department of General Services
155.940	Department of General Services Pagers
450.437	KNSD-TV Channel 39 Dispatch
450.337	KFMB-TV Channel 8 Dispatch
161.700	KGTV-TV Channel 10 Dispatch

In her letter Laura pointed out that she is a new subscriber and that she will contribute frequencies on a regular basis. Welcome aboard, Laura!

Since March is a windy month, let's wrap up the Frequency Exchange with a visit to the windy city of Chicago:

CHICAGO

151.00	Chicago Department of Transportation
151.295	Chicago Park District, West Shops
151.625	Business use
155.115	Cook County Zoo
159.09	State Attorney General
159.405	Chicago Park Zoo (low power)
450.2875	Shadow Traffic
171.825	Museum of Science and Industry (wireless mics)
461.50	Salvation Army Canteen Service

If you want the Frequency Exchange to visit your town, simply send your frequency listings to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Air Force Tower

The Air Force has plans to build a 299 foot tower in central Ohio. The tower site, which will be unmanned, can relay emergency and wartime messages among strategic military facilities. The tower will occupy about 11 acres and it will also include fences and three small shelters. (News clipping from Norman Wittschen III)

Blast from the Past

Bob DiCorcia, from Franklin Park, New Jersey, needs your help. Bob has a ROBYN model 8+8/16 crystal controlled scanner, but he doesn't have the owner's manual. If you have the manual, don't send it to the Scanning Report. Simply send in an SASE and I'll put you in touch with Bob.

Wrap Up

We started off with mobile data terminals, offered free scanning equipment in the Treasure Hunt, provided loads of frequencies for various areas and gave you the nationwide vehicle tracking frequency. You expect more from Monitoring Times and we do our very best to bring you the latest information available.

However, we can't do it alone. All the columnists need your support. Without your ideas, comments and news clippings, we wouldn't be the most popular magazine in the business. So don't keep your monitoring expeditions a secret. When you share them with a Monitoring Times Columnist, you share them with the World!





EEB THE NATION'S #1 SWL SUPPLIER ORDERS 800-368-3270



ICOM R9000 THE ULTIMATE RECEIVER

- 100 kHz to 2000 MHz
- CRT Multi-Function Display
- Spectrum Slope ± 100 kHz
- 1000 Memories-10 Banks of 100
- 4 Antenna Inputs
- Watch ICOM Ads for Detailed Specifications
- Suggested List \$5495 Call for Quote





Top of the Line Portable Now with CW/SSB . 155-30 MHz

· 36 Memories · Keyboard Entry RFB40 \$189.95 RFB20 \$119.95 RFB10 \$89.95



PLL-All Band LW-MW-SW-FM 45 Memory Keyboard Entry

- . Compact Size FM Stereo with Headset
 - Introductory Priced \$229.95

SONY ICF SW20

Compact AM-FM 7 SW Bands Shirt Pocket Size (Replaces ILF4920)

Price \$99.95 + \$5 UPS

GRUNDIG 500



- · Synchro Detection · All Band All Mode . Superb Audio
- Keyboard Entry

Introductory Priced \$499.00

1989 Catalog. Get All The Details. 36 Pages. Sent 1st Class. FREE in USA. Canada \$1.00. All Others \$3.00.

ICOM

R71A-This is our best seller. ICOM R71A has all the features one expects in a world class receiver. All mode AM, SSB, CW, RTTY, FM (OPT). Complete coverage. 1 to 30 MHz. 3 Filter positions, direct keyboard entry. 32 memory channels, PLL tuning in 10 Hz steps for exact frequency. Many ICOM options plus EEB high performance package. (CALL)

ICR71A \$849.00 + \$12 UPS



R7000-There is nothing to compare with the R700 under \$12,000. This is the most sophisticated V/UHF receiver ever offered to the public. No wonder it's our best selling V/UHF receiver. All mode AM, SSB, CW, FMW, FMN-25 to 2000 MHz (20 kHz to 2 GHz w/NOVEX FC7100), direct keyboard entry. 99 memory channels, many ICOM options plus EEB options and high performance package deal. (CALL)

ICR7000 \$1019.00 + \$12 UPS

JRC-NRD

A high-class, general coverage receiver with expandability looking to the future. The NRD-525 will change your shack in



to a new universe! 0.09 MHz to 34 MHz. Pass band shift. 200 memories. Direct keyboard entry. AM, FM, CW, SSB, RTTY, SSB. Notch filter. V/UHF converter Option. Filter options. NRD525 \$1179.00 + \$12 UPS

KENWOOD

The KENWOOD R5000 is the new high perfor-mance receiver from the in communica

tions technology, 150 kHz to 30 MHz, 100 memories.

Keyboard entry, AM, FM, USB/LSB, CW, FSK, VHF

108-174 Opt VC20. \$849.95 + \$10 UPS

The KENWOOD R2000 150 kHz to 30 MHz 10 memories. AM, FM, SSB, CW. VHF 118-174 MHz opt VC10. R2000 \$649.95 + \$10 UPS

YAESU

FRG8800 offers functionality and operating convenience for the serious shortwave listener. 150 kHz to 29,999 MHz.



Direct keyboard entry. Dual Clocks/Timers. Wide/Narrow Filter. 12 Memories. AM, SSB, CW, FM. VHF 118-174 MHz option \$119.95. FRG8800 \$649.95 + \$10 UPS

FRG9600 VHF/UHF General Coverage Receiver. 60-905 MHz. 100 Memories. FRG9600 \$529.95 + \$6 UPS

GRUNDIG

The Satellit 650 International is the ultimate in German crafted portable radios. Excellent audio. 510 kHz to 29.999 MHz. 24 hour clock/calendar. 3



Bandwidths. 60 Memories. AM, FM, SSB, CW. Keyboard Entry. PLL Control. Nicad Battery Option.

New Low Price \$849.00 + \$12 UPS
The Satellit 400, with its rounded corners and smooth lines is the obvious "style leader" in personal portables, covers all shortwave bands plus MW and FM. 24 Memories. Keyboard Entry

New Low Price \$319.95

SANGEAN

ATS803A. So much HITECH in one package, a super value. Covers all SW Bands. Tunes .150-30 MHz + FM 88-108, 9 Memories Auto Scan. Keyboard Entry. Stereo w/Headset or Line output. AC Adapter included.

ATS803A \$199.95 + \$4 UPS



SG789. Slightly larger than SONY ICF 4920 same coverage plus stereo w/headset. SG789 \$69.95 + \$4 UPS

MS101, All new mini set similar to Panasonic RFB10. 9 Band, AM, FM, 7SW, stereo w/headset MS101 \$79.95 + \$4 UPS

MS103. Same as MS101, 9 SW Bands. MS103 \$99.95 + \$4 UPS

CLOSE-OUT

JIL SX 400 Close Out Save \$300. 26-500 MHz (.1-1300 MHz w/opt. call) Digital keyboard - Readout memory scan 13.8 VDC. Much More Call. SX400 List \$695 while they last \$399 + \$6 UPS

SONY-THE ONE AND ONLY

ICF2010 is the market leader of portables. our best selling portable. Full coverage. .15 to 30 MHz, FM 76-108 MHz, Air Band 116-136 MHz. AM, FM, CW, SSB. Sync Detection. 32 Memories. Keyboard Entry. Many Features. ICF2010 \$369.95 + \$6 UPS



ICF2010



ICFSW1S ICF2003

ICFSW1S. The newest in miniaturization only 2 34 " imes 4 34 ". Tests show it as best of sub-compact case, active antenna, world AC Power Pack, Phone, SWL Book, Travel with the "SYSTEM" or just the Radio, Complete coverage to 30 MHz FM 88-108. Keyboard Entry. LCD Readout/Clock

ICFSW1S \$319.95 + \$4 UPS

ICF2003 delivers most performance of all portables in the mid-size class. .15-30 MHz. AW, CW, SSB. 76-108 MHz FM. 10 Memories. Keyboard Entry. Paperback book size. Optional AC Adapter. ICF2003 \$279.95 + \$4 UPS

PRO 80 looks like a scanner . Covers .15-108 MHz 115-223 MHz with supplied converter • Multi-Mode AM-FM-CW-SSB • 10 Memories • 4AA Power Opt Nicad EAC Adapter.

PRO80 \$399.95 + \$4 UPS

MAGNAVOX

D2999, 146-30 MHz FM 88-108. Keyboard entry. 16 Memories. Multi-mode AM. CW. SSB. FM, Scan. 12/24 Hour clock. D2999 \$299.95 + \$6 UPS



D2935. Rated best value in a portable (IBS). Covers all SW Bands. .146-30 MHz, 9 Memories. AM, FM, CW, SSB. Keyboard Entry

ANTENNAS

DATONG AD370 HF. .1-30 MHz outdoor active, rated AD370 \$129.95 + \$4 UPS

SONY AN1. HF .1-30 MHz outdoor active. Our #1 seller AN1 \$84.95 + \$6 UPS for 3 years

EAVESDROPPER. Outdoor passive trapped dipole. 9 SW Bands. 43 ft. long. 100 ft. lead. Everything you need. Best Seller SWL \$59.95 + \$4 UPS

ALPHA DELTA SLOPER DXSWL \$69.95 + \$5 UPS

NOVEX NEW PRODUCTS

CRIS 6000. Computer Radio Interface System. The ultimate HITECH computer (IBM PC) system for control, logging, scanning, spectrum analysis. Using most current radios. Free CRIS Newsletter (CALL). CRIS R7000 \$499.95 + \$8 UPS

RACKMOUNT. Novex RM Series Rackmount hardware for most popular radios ICOM, KENWOOD, YAESU receivers and transceivers.

Prices from \$79.95 + \$5 UPS



ELECTRONIC EQUIPMENT BANK NEW RETAIL LOCATION 137 CHURCH ST. N.W. **VIENNA, VA 22180**

ORDERS: 800-368-3270 LOCAL TECH: 703-938-3350 FAX: 703-938-6911

• PRICES SUBJECT TO CHANGE

PRICES DO NOT INCLUDE FREIGHT

• SORRY, NO CODs

RETURNS SUBJECT TO 15% RESTOCK FEE

what's new?



ICOM Releases Three New Radios

The IC-R72

COM's new IC-R72 is scheduled for release this month. The follow-up to the very popular IC-R71A, the 'R72 is a compact (9.5" wide by 3.7" high by 9.0" deep) all-mode receiver that covers everything from 100 kHz to 30 MHz in SSB, AM and CW modes. And FM receiving mode is also available by adding an optional UI-8 FM receiver unit.



Sensitivity is reported to be high. In addition, the 'R72 boasts 100 dB dynamic range, 101 memory channels (actually 99 memory channels and two independent scan edge memories. Operating frequency and mode can be stored into any memory channel.), and the same PLL circuitry found on the state-of-the-art (and rather expensive) IC-R9000.

Other features include built-in RF attenuator and preamplifier, a noise blanker, a built-in clock with timer function plus multiple scan functions.

ICOM officials tell us that the new IC-R72 will be available this month although the price of the unit has not yet been set.

The IC-R100

The IC-R100 is compact, wideband receiver designed for both home and mobile use. It provides continuous coverage from 100 kHz to 1856 MHz in AM, FM, and wide FM modes. Tuning is by either a keyboard or tuning control or by one of 121 memory channels. 100 memory channels store operating frequencies, mode and even RF attenuator and preamplifier settings. Twenty scan edge memory channels are used for specifying 10 pairs of frequency ranges, plus one independent memory channel used for priority scan.

The IC-R100 also features three separate antenna connectors, a built-in preamplifier and attenuator, and a built-in 24 hour clock with a variety of timer functions. The IC-R100 is also scheduled to be available this month but again, no price is yet available.

IC-R1 Scanner

Finally, ICOM offers the IC-R1 wideband mini-hand-held. Providing continuous coverage from 100 kHz to 1300 MHz (with AM, FM, and Wide-FM modes), the 'R1 measures just 1.9" wide x 4.0" high by 1.4" deep. The unit is powered by built-in NiCds or an optional battery pack.

Scanning functions include programmed scan, memory scan, selected mode memory scan, and auto memory write scan. Tuning is by either keyboard, rotary tuning control or by one of 100 memory channels. There's also a 24 hour clock/timer, a powersaver function, adjustable LCD

contrast, a signal indicator, and an external DC power jack with battery charge capability. ICOM bills the IC-R1 as "the world's smallest full-

featured receiver." It will be at dealers this month.

出馬思

You can get free literature on any of these new ICOM receivers by dialing toll-free 1-800-999-9877. Leave your name, address and the name of the radio that you'd like literature about. It's free and open 24 hours a day.

Your Favorite Music

nyone who travels cross-country by car knows that finding a good radio station in an unfamiliar area can be a major headache. Up until now, the only answer was a bottle of aspirin or a copy of Dr. Bruce Elving's superb FM Atlas station directory.

Now comes the Technics CQ-ID90 car stereo. Stored inside this remarkable radio is an ID Logic unit with information for over 4,500 AM and over 4,900 FM stations from more than 5,100 U.S. cities (virtually every city with a population of 10,000 or more.)

Here's how it works. For example, if you are traveling

from New York to Boston, all you do is tell the radio that you're traveling north, that you like rock music. The ID Logic automatically locks onto the six strongest stations playing rock. As the user continues to travel, the ID Logic continues to find the strongest stations (although every 60 miles you must reset a "directional" button) and provide "a constant stream" of rock 'n roll.

Six program formats can be chosen -- classical, Country and Western, Rock, Jazz, Easy Listening, and Talk. Stations broadcasting with less than 1 kW are not stored in the radio. The Technics CQ-ID90 will be available this May. Suggested retail is expected to ring in at around \$800.00.



Scanner Mod Handbook

he Scanner Modification Handbook is a collection of more than 20 scanner modifications developed, refined, tested and compiled into a 160 page book by communications engineer Bill Cheek. Change a chip, add a switch and your PRO-2004 or PRO-2005 becomes a superscanner with 6,400 channels -- your PRO-34 handheld suddenly has a 3,200 channel capability!



Other mods restore frequencies, add S-meters, improve squelch action, disable the "beep," protect from voltage surges, interface a scanner with any communications receiver (for fine tuning, noise limiting, SSB reception, etc.), and more. Other mods are for BC-200 XLTs. BC-750 XLT, and BC-950XLT.

With some ingenuity, other scanners might also be modified. Each includes photos, charts, diagrams and step-by-step instructions. According to the author, all of these modifications can be performed by the average electronics hobbyist.

There are also chapters on scanning and the law, how cellular phone systems work (includes frequency charts), plus scanner tips, hints, and techniques. How to get emergency power for a scanner, and more.

The Scanner Modification Handbook is available for \$17.95 plus 1.20 book rate or 2.30 UPS shipping from DX Radio Supply, P.O. Box 360, Wagontown, PA 19376.

Weather Max

eather Max is a VHF weather monitor radios that delivers up-to-theminute NOAA weather information 24 hours per day from over 390 locations. Also known as Midland model 74-102, the radio can provide continuous monitoring or be set to come on only when NOAA is announcing dangerous weather conditions.



For more information on the Weather Max, visit your local Midland radio dealer.

Computer Control for ICOM R7000s

wners of ICOM IC-R7000s can now control their radios using an IBM computer. The Systems and Software International RCSS (Remote Computer Scanning System) provides computer-based intelligent control over the 'R7000 plus frequency database support.

The RCSS runs on any IBM compatible computer with 640k bytes of RAM, EGA or VGA graphics card and monitor, and one available RS-232 communications port.

Install the RCSS and a drawing of the front of an ICOM IC-R7000 will appear on your computer monitor. All you do is use your mouse or keyboard to manipulate the radio just as if the radio itself modes and more.

The RCSS for IBM compatible computers is available for \$239 and includes software, user manual, external interface. and all necessary interconnecting cables. (A Macintosh version has been available since 1987).

For more information, call 703-680-3559 or write Systems and Software International at 4639 Timber Ridge Drive, Dumfries, Virginia 22026.

Azimuth World RadioSphere

zimuth Communications is offering a handblown, 12 inch, clear acrylic world sphere that ' shows ham radio DX prefixes, world radio zones, latitude and longitude, the International Date Line, cities, countries and more.

Land masses are gray. oceans are clear and lettering is red. Nomenclature for

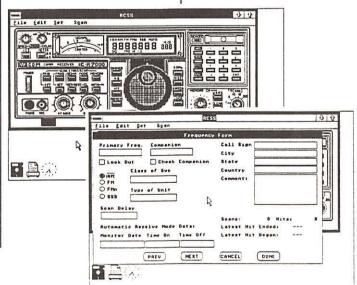


black.

The World RadioSphere would make a handsome addition to any radio room. And it can be yours for \$119.95 (plus \$6.95 shipping and handling) from Azimuth Communications Inc, 3555 Fourth Street, Santa Rose, California 95405.

MFJ Multiple DC Outlet

he MFJ-1112 Multiple DC Power Outlet connects directly to your 12 volt DC power supply to give you six pairs of heavy duty binding posts for connecting your accessories. RF bypassing keeps RF out of the power supply from the DC line outlet. The attractive black aluminum cabinet measures a sleek 13.5" by 2.75" by 2.5" and comes with a one year guarantee. You can get your Multiple DC Power Outlet for \$24.95 from your favorite radio store or by calling MFJ at 1-800-647-1800.



was being operated. Features include automatic detection and storage of all active frequencies encountered by the receiver while scanning, storage of unlimited banks of frequencies (each bank holds 1000 frequencies), unattended operation, various scanning



To have your new product or book considered for review in Monitoring Times, send it to Editor, 140 Dog Branch Road, Brasstown, NC 28902.

Putting the Computer to Use

Every now and then I come upon a bit of statistical information that gets my juices flowing.

Recently I read someplace that something on the order of one out of every four homes now has a personal computer. Further, within the next few years, this number can be expected to jump to 50 percent of all households.

If we take a quick look around at the kind of folks who read *Monitoring Times*, I think we might find that well over 50 percent of our readers currently have a high-priced electronic abacus on their desk tops.

This is going someplace, right, Uncle Skip?

Well now, knowing that a lot of folks out there have home computers, it might do some good to take a look at some of the possibilities for using those systems in support of the monitoring hobby.

The great promise of the home computer is that it can reduce the hassle surrounding a lot of daily tasks. But Old Uncle Skip's personal observations indicate that a lot of those machines tend to sit around collecting dust instead of data. So warm up your keyboards, friends; it's time to check out --

UNCLE SKIP'S GUIDE TO COMPUTERS AND DXING

SYSTEMS

If you can believe everything you read in computer magazines, the home computer market has distilled down to three systems. Commodore's Amiga, Apple's Mac, and just about everybody else's PC-MS/DOS clones.

These systems do, in fact, represent the current state of the personal computer art. However, there are many other computers that have been somewhat left in the technological dust while still remaining fine home systems.

Commodore's 64 and 128 systems along with the various Apple II systems probably account for the largest block of home user computers out there. While not on the cutting edge of technology, these "eight-bit" personal computers are more than adequate for all manner of tasks that a radio hobbyist might throw in their direction. Also, these systems have tens of thousands of pieces of software available to them, many of which are of very low cost. Some are even free.

The point is, if your home system meets all

of your current computing needs, you do not have to run out and buy into the latest technology (at a cost in excess of one thousand dollars). Instead you can spend your money on improved receivers. If you already own a state-o-da-art PC, don't get your nose out of joint. You will find that most of what Old Uncle Skip has to share will apply to you, too.

SOFTWARE SOURCES

These days software is everywhere. Because this whole process of building up a software library might be new to the beginner, let's review the kind of software that is out there.

COMMERCIAL SOFTWARE -- This is the stuff you see in the stores. This type of software is copyrighted and very often copyprotected, so that you cannot indiscriminately make a dozen copies and give them to your friends. Because of production costs, this is the most expensive kind of software. A word to the wise; just because a piece is commercial doesn't mean it is better than a shareware or public domain piece of software. Compare carefully before you lay down your dinero!

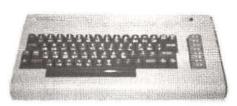
SHAREWARE — This is one of the neatest concepts around! While it flies in the face of traditional marketing, it flies like an eagle. In this scheme, the software author makes the software available for copying and distribution through Bulletin Boards and User Groups. You can copy it and share it with your friends.

All the author asks is that, if you like the piece, you send the author a small fee to offset development costs and to provide you, the user, with updates and improvements. By eliminating the commercial software distributor, the author and user work together to keep good software on the market.

There are shareware word processors and data bases that make many commercially produced programs look sick. Shareware is also the best way to locate useful software for some of the less popular home computers.

PUBLIC DOMAIN -- These are programs that are available for free or, if purchased through a public domain software house, for a nominal copying charge. In this case, free does not always indicate cheap. Several excellent and useful radio hobbyist programs can be found in the public domain.

This software can usually be downloaded, via modem, off of both commercial and noncommercial on-line systems. Also, many computer user groups maintain large public domain libraries for use by their membership.



Don't let that Commodore sit around collecting dust when it could be collecting data!

DATABASE PROGRAM The ultimate log book

Basically, anything you currently write down as a form of record keeping for your radio hobby can be entered into a database. This information will be in a form that will allow for many uses far beyond the traditional file card pile. Don't forget, disks take up a lot less room.

Database programs are usually equally useful and frustrating. I say this because most of these software packages will require configuration and then data entry of your collection of information in order to make them useful. I must also say that no matter how boring or lengthy the initial start-up process may be, hang in there, Compadre! Once you get your data all compiled, you will then be able to massage it in an infinite number of ways.

Now how would a DXer make use of a database? How about a log that allows you to call upon information by date, frequency, time, country, or any one of a hundred other possible field titles. How about files within that base that list stations heard, stations confirmed, and (most importantly) stations you want to hear. Your "Hit List" file may contain information about the best times and frequencies you might want to enter into your scanner every time a parade or sporting event occurs in your home town.

No matter what system you have at home, it should be fairly easy to locate several database programs. Test drive a few until you settle on one that works best for your application.

WORD PROCESSORS

Let's put the cards right on the table! Old Uncle Skip could never have become the master of radio publishing that he is today without the aid of his trusty word processor.

Think of a word processor as a typewriter that can cover a multitude of sins. It is able to do this by allowing you to preview your document prior to committing it to print. Depending upon the sophistication of your particular word processing package, you will

find yourself able to juggle, massage, and improve upon your text in any number of ways. Most useful to some of us "pros" is the spell checking features included in many WP pack-

Now as to DX useful tasks, a word processor will allow you to develop "form letters" that can be utilized in sending out QSL reports. Likewise, Utility DXers can develop Prepared Form Cards useful in assuring confirmation from difficult sources.

If you are in this hobby for any length of time, you will find yourself corresponding with a lot of folks. Your word processor will help you better than any typewriter ever could.

Also, like the database program, the word processor can cut down on your personal paper chase by allowing you to store information on disks or tape instead of in bulky file cabinets.

Most systems have dozens of word processors available for your use. Old Uncle Skip has made one observation, though. People tend to stick with one word processor even though better ones may come along. I guess it has to do with needing to relearn all the various commands that make word processing so useful. So pick your first word processor carefully, it's kind of like getting married without all of the benefits.

SUPPORTIVE SOFTWARE

It may not surprise you that some of the pioneers of personal computing were also radio hobbyists. One of the first readily available programs written in BASIC is called MINIMUF. It is a program that gives the user the Maximum Usable Frequency for radio communication at any given time. This little gem is in the public domain too, and has been translated into every system-specific variation of BASIC. In other words, no matter what computer you use, MINIMUF will be there to help you with your radio listening.

With availability varying from system to system, many other similar programs have been written. Everything from antenna and circuit design programs to software that will give you antenna headings for any location on the planet. Even those folks who enjoy tracking satellites will find software to aid in their search.

A good source for tracking down this kind of software could be a neighborhood amateur radio operator. Don't rule out your local computer user group as a resource.

EDUCATIONAL SOFTWARE

You will find dozens of programs out there to help you learn or relearn such basic skills as mathematics and typing. All of these are quite useful because there is no more patient tutor than a home computer. They never get mad, they just tell you to try again until you get it right.

ALPHA DELTA Model DX-EE **Limited Space High Performance Multi-Band Dipole**



- "No-Trap" design provides exceptional broad spectrum receive coverage from 5 MHz thru 30 MHz. Covers world-band broadcasts and "utility" frequencies in a single antenna.
- 2 kW transmit capability in the 7, 14, 21, and 28 MHz ranges without a tuner. Broad HF range transmit coverage with a widerange tuner.
- Designed for rooftop, attic, and condo installations where space is at a premium. Only 40 ft. overall length.
- · kW size components, stainless steel hardware, and 12 GA. copper wire means the Model DX-EE has less loss than light-duty receive-only antennas. The Alpha Delta design concept does not permit the use of small, lossy traps as found in other brands. If you put RF power in the small trap-type models they will "smoke"-not what you want in a precision antenna!
- Frequency selection in the Model DX-EE is by a combination of special broadband RF choke-resonators and full size radiators on

various ranges. An antenna loaded with a number of traps in each wire is so narrowbanded, its useful ranges are severely limited.

- · Special hardware and connector arrangement on the Model DX-EE accepts either balanced or coax feed. With other brands you have to make a choice of models.
- The instructions with Model DX-EE show how to tune it for transmit. For receive applications no tuning is necessary. Since it comes assembled, just take it out of the box, put it up and enjoy great DX!

Model DX-EE . . . \$84.95 ea. at your Alpha Delta dealer. Add \$4.00 shipping & handling for direct orders in the U.S. Exports quoted.



ALPHA DELTA COMMUNICATIONS, INC.

VISA

P.O. Box 571, Centerville, Ohio 45459 • (513) 435-4772



A useful skill in this hobby is geography. It helps to know where Fiji and Mauritania are to make your MINIMUF and Beam Heading programs useful. There are many geography tutors out there in computer land. There is even one commercial program, "Where in the World Is Carmen Sandiego," that turns learning geography into a great game.

Anyone out there interested in working toward any class of amateur radio license will be pleased to know that there are all manner of software packages written to help you bone up on both the code and theory portions of these

No matter what skill you want to brush up on, you should be able to find a few programs that will bring you patiently up to speed.

ON-LINE SERVICES Tapping into cyberspace

Once your computer has all the attachments that allow it to operate in a useful fashion around the old homestead, you will find one more accessory will serve to open up an entire world to you. A MODEM (short for Modulator/Demodulator) will allow you to connect your computer to your telephone line in order to access information from other computer systems. These systems break down into two groups.

Commercial systems such as Compuserve, Q-Link, Prodigy, and GEnie charge a fee for access and subsequent connect time to allow you to acquire information from them. Many of the public domain programs we have discussed before can be found in the on-line libraries of these systems.

Noncommercial systems are those set up by dedicated computer enthusiasts who charge no fee but set certain basic ground rules for access and participation.

A word of caution to new modem users. These puppies can run your phone bill up real quick. Pay attention to your connect time so you don't bankrupt yourself.

ONWARD AND UPWARD

As you grow in your knowledge of both the computer and radio hobbies, you will find many exciting ways to use your receiver and computer together. You will find that you can build or purchase interface boards that allow your computer to translate code, RTTY, FAX, and packet radio signals off the air. If you are the proud owner of one of those new-fangled receivers that have a computer port, you will discover that you can use your computer as an almost infinite memory resource.

So there you have it, folks. Wade on in, the water ain't that deep!

mt

Gettin' it together

Exploring the world of federal frequencies can be interesting. The biggest problem is knowing where to listen. But once you do start finding new frequencies, you find yourself in the midst of another problem: how to organize your discoveries for future use. There is nothing more nerve racking than having to look for a specific UHF DEA frequency amongst scraps of paper, post-its, or whatever. It is time to get yourself organized.

Believe old Rod when I tell you that in the future you will not regret this and you will suffer less pain in the long run. Trust me.

First of all, if you own a computer there are several very good ways to organize your frequencies. The way you organize your notes will depend on your computer and the programs you have available.

Those of you with word processing capability might find it useful to organize a complete list of frequencies like you would see in the *Police Call* book. The Consolidated Frequency Table that appears there is a very good starting point, and having everything set up in frequency order complements the frequency searches I talked about last month. You can set pages in your word processor to appear as in Figure 1.

With a word processed frequency list, it is easy to add new frequencies, expand your notes, etc. Some of you might ask what A# means. Well, I like to code things and for me, the "A" means that the frequency is active in my area. The"#" means that I have confirmed the usage of that frequency in my area. You can be real innovative in this respect and use letters and symbols for all kinds of things in your frequency listings.

Several things you should include when adding notes to your list and monitoring include:

- Is this a repeater input, output, or simplex frequency?
- 2. Is this a link repeater? (A repeater that links other repeaters)
- 3. Has the agency using this frequency used

a frequency designator when referring to this frequency? (i.e. -- Alpha channel, F1, channel 2B, etc.). Really helpful when maneuvering around a government radio system.

- 4. Especially on unknown channels, what unit designators are you hearing? You might be able to reference these designators with known channels and at least figure out who you are hearing.
- Note the location of the repeater and/or office/base using the frequency. A lot of times things of this sort are heard on the air while units are communicating with each other.
- 6. Make a note what the frequency is being used for (i.e. -- maintenance, surveillance, dispatch, security channel, etc.). By actually listening close to a channel's conversation, a lot of times you can determine what a channel is being used for.

Word processing your frequency list does have some drawbacks. If you decide later on that you want to list your frequencies by the transmitting agency voice frequency then you are going to have to retype your information or do some heavy duty editing on your frequency list. Overall, if all you have is a word processing program, you will find that using it to process your frequency list is a much better proposition than pen and paper methods.

Another avenue open to computer users is the database. While databases can be complicated, the database offers the best of all worlds to keep scanner records. A database can do a lot more than any word processing program. The major problem is learning how to use the program and deciding what data fields will be set up and how they will look

Once your data is entered, you can then sort the databases by frequency, no matter what order you enter the data in. Also if properly coded, you could sort by agency, location, or any combination based on how you set the database up.

Another nice feature of most databases is that you can take the data and import (bring into) it to a word processor to further edit the information. All in all, a database is a good way to store the results of your scanning searches and local discoveries.

If you don't own a computer, the best way I have found to organize notes is to set up a notebook by frequency as I demonstrated with the word processor setup. Grab a copy of *Police Call* and set up your written list by frequency. Then you can make notes on each frequency as to what is there, if it is active, and any other information you gleam from monitoring the frequency. Of course, you will not be able to manipulate the data like you would with a computer, but at least you can keep some sort of record for future use.

These are only some of the ways to record data on what you are hearing on the scanner. I would be interested in hearing from some of you as to the methods you use. I will be happy to pass them on to the rest of the *MT* family of readers through this column. The address is in the masthead.

Air Route Traffic Control Centers

I just got a letter from a frustrated fedfile buff and he asks: "Rod, I want to listen to military aircraft on my scanner, but I don't know where to start looking. What do you suggest?"

The best place to start, folks, is with the FAA's ARTCC. To put that into nongovernmental language -- that's the Federal Aviation Administration's Air Route Traffic Control Center frequencies.

Throughout the country, the FAA has placed remote transmitters linked to several central centers via microwave. These remote transmitters feed radio comms and radar information to and from the center.

Controllers at the center can then control selected slices of airspace and the aircraft within that airspace from a central location. These central centers are all a part of the ARTCC system. In fact, pilots often refer to these center control facilities as "Center" over the air. This system is the FAA's way of handling aircraft traversing the country from airfield to airfield.

By monitoring these ARTCC frequencies, the mil monitor can sometimes pick up other frequencies when one controller hands off the flight to another controller. Each center divides up the airspace that they are responsible for into sectors, and assigns a controller and set of frequencies to that sector.

Figure 1				
Frequency	Service	Notes		
162.400 A# 162.450	Weather Broadcast UAR UER	NOAA Weather Radio-24 hour continuous		
162.475 162.500	Weather Broadcast UFA	NOAA Weather Radio		
162.550 162.6125	Weather Broadcast UAF UGF UIP UNS	NOAA Weather Radio		

A controller handling that sector will handle not only civilian aircraft on the VHF-Air Band, but also military aircraft in the 225-400 MHz military aircraft band. Usually the civilian and military frequencies are paired together and a controller's voice goes out on both frequencies simultaneously.

Normally what you hear will be routine reports of the aircraft's position and altitude. Also, in times of severe weather, the aircraft might ask the ARTCC controller to move around the bumpy stuff. If the aircraft is having some sort of trouble, you will hear that sort of comms also. All-in-all, the FAA's ARTCC frequencies are a great place to start one's venture into the world of military aircraft monitoring. These FAA centers basically cover all the airspace in the continental US.

Starting this month, I am offering a complete list of these center frequencies. This list for each center includes: all the remote sites (locations) within the center and both VHF civilian and military frequencies.

If you would like this complete list for the whole continental US-FAA centers, then drop me a line c/o Monitoring Times in Brasstown and mark it CENTER, c/o Rod Pearson. Oh, yeah, I'm not rich, so please include \$2.00 to cover postage, reproduction, and handling.

If you aren't rich either, then here is a good deal: Send your list of federal/military frequencies and I will ship the CENTER list to you for just an SASE and two 25 cent stamps. The CENTER list is the federal government's latest on the ARTCC system and is current as of a month ago, so you are getting the latest goodies.

Big Easy Frequencies

Monitoring Times' own Larry Van Horn of Utility World fame has sent his own list of the local scene in New Orleans, the Big Easy. Larry says that New Orleans has a lot of military/government activity. The next time you go to the Big Easy for Mardi Gras, you might want to drag your scanner and this list along and give a listen between parades.

Thanks, Larry, for the nice list, and I hope we see more fed frequencies from the Big Easy real soon.

With Larry's list I will close this month's fedfile. Be sure to send your freq list to the column and also order your ARTCC Center list. Till next month, 73, and it's time to get a

cubo . . . or two.

$\mathbf{WOW!}$

Have you seen **U.S. Scanner News**

The fastest growing all scanner magazine on the market today.

Try it, you'll like it.

Send \$7.50 for a 6 month sample subscription, \$15.00 for a One year subscription, Two years \$29.00, Three years \$43.00. Foreign subscription \$19.50 per year.

Payment must be included with order. (Washington state residents add 7.6% tax.)

Bob's Publications P.O. Box 1103 Vancouver, WA 98666

CITIZEN'S GUIDE TO SCANNING

Bob Kay's Best Selling Book A complete guide to scanning by popular MT columnist Bob Kay. A soup-to-nuts book complete with exhaustive frequency lists. A great book for anyone who scans -- wants to. \$12.95 + 1.20 book rate or 2.30 UPS from DX Radio Supply, Box 360, Wagontown, PA 19376.

What if my MT is late?

If your copy of MT doesn't show up on your doorstep, give it until the 10th of the month, and then call us. We can replace up to two issues per year, but give the Post Office a chance!

Monitoring the Big Easy

NAS New Orleans (Belle Chase)

ATIS (Automatic Terminal Identification System -- 276.2

Approach/Departure -- 123.85 256.9

NAS Tower - 118.7 126.2 126.3 340.2 360.2

NAS Ground -- 126.2 382.8

USCG at NAS -- 165.2625 165.3375 171.2375 (Repeat of marine channel 16 and

CG unit to unit) 171.3375 381.7 381.8 383.9

NAS Weather -- 265.8

VA-204 Base Radio -- 301.3 (Naval Reserve A-7E squadron)

Search and Rescue - 282.8

Ground Control Approach frequency - 308.4

Navy - 139.50 Base Security/140.10 Fire and Crash/140.075 Naval Investigative Service repeater input/140.775 NIS repeater output/148.325 Joe Ellen Smith Hospital paging/148.350 Naval Support Activity Security/148.275 Naval Support Activity Security Tactical/138.82 138.85 140.50 140.65 140.8 142.675 148.575 149.01 149.350 150.75 150.375 261.8 271.4 275.4 275.7 283.4 285.8 290.0 305.8 307.7 312.2 313.8 320.2 355.8 339.6 348.1 358.6 413.025

Air National Guard - 149.235 138.1 148.575 150.225 163.4875 163,5125 165.0125 165.1125 165.1375 155.280 Medical ambulances/271.2 351.2 413.3 413.4

New Orleans Moissant Int'l Airport

Flight Service Station -- 255.4

Approach/departure - 256.9 269.2 284.7 290.3

Tower -- 254.3

FAA -- 165.875 169.300

New Orleans Army Reserve

38.89 150.750 163.000 (page) 163.025 163.5375

Houston ARTCC Center -- 380.2 and 343.9 (West)/269.5 (East)/279.6 (Popup)

Camp Shelby -- 297.1 275.6 (NORDO or No radio)/298.6 (Clairborne primary)

Eagle G Discrete -- 277.4 287.1 (Gulfport Approach)

Southern Seaplane Base (Belle Chase) -- 32.05 40.8 264.2 267.8 358.2

Going home to Canada

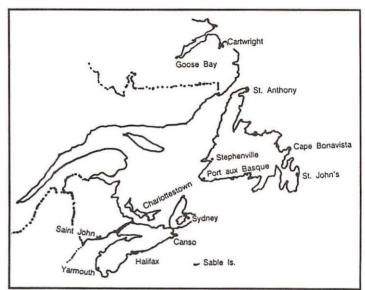
Since it has been a while since we looked at my own native land, I thought that we might investigate some of what the Atlantic provinces of Canada have to offer. All frequencies are in kilohertz.

First, the following listings show what the Canadian Coast Guard has to offer in Morse code.

406	VOJ	Stephenville CG Radio	Stephenville, NF
416	VOK	Labrador CG Radio	Cartwright, NF
420	VCP	St. Lawrence CG Radio	St. Lawrence, NF
430	VOO	Comfort Cove CG Radio	Comfort Cove, NP
444	VOK	Labrador CG Radio	Cartwright, NF
446	VCS	Halifax CG Radio	Halifax, NS
448	VCM	St. Anthony CG Radio	St. Anthony, NF
450	VAU	Yarmouth CG Radio	Yarmouth, NS
460	VON	St. John's CG Radio	St. John's, NF
464	VCO	Sydney CG Radio	Sydney, NS
478	VON	St. John's CG Radio	St. John's, NF
484	VCS	Halifax CG Radio	Halifax, NF
489	VAU	Yarmouth CG Radio	Yarmouth, NS
489	VCM	St. Anthony CG Radio	St. Anthony, NF
489	VCO	Sydney CG Radio	Sydney, NS
4285.0	VCS	Halifax CG Radio	Halifax, NS
6491.5	VCS	Halifax CG Radio	Halifax, NS
8440.0	VCS	Halifax CG Radio	Halifax, NS
12874.0	VCS	Halifax CG Radio	Halifax, NS
16948.5	VCS	Halifax CG Radio	Halifax, NS
22387.0	VCS	Halifax CG Radio	Halifax, NS

On Single Sideband try looking for the following:

2514	VCM	St. Anthony CG Radio	St. Anthony, NF
2514	VCP	St. Lawrence CG Radio	St. Lawrence, NF
2514	VCS	Halifax CG Radio	Halifax, NS
2514	VOJ	Stephenville CG Radio	Stephenville, NF
2514	VOK	Labrador CG Radio	Cartwright, NF
2514	VOK	Labrador CG Radio	Hopedale, NF
2514	VON	St. John's CG Radio	St. John's, NF
2514	VOO	Comfort Cove CG Radio	Comfort Cove, NF
2530	VCA	Charlottetown CG Radio	Harrington, PE
2530	VCO	Sydney CG Radio	Sydney, NS
2538	VAU	Yarmouth CG Radio	Yarmouth, NS
2538	VCP	St. Lawrence CG Radio	St. Lawrence, NF
2538	VOK	Labrador CG Radio	Cartwright, NF
2538	VOK	Labrador CG Radio	Hopedale, NF
2538	VON	St. John's CG Radio	St. John's, NF
2538	VOO	Comfort Cove CG Radio	Comfort Cove, NF
2582	VAU	Yarmouth CG Radio	Yarmouth, NS
2582	VCA	Charlottetown CG Radio	Harrington, PE
2582	VCM	St. Anthony CG Radio	St. Anthony, NF
2582	VCO	Sydney CG Radio	Sydney, NS
2582	VCP	St. Lawrence CG Radio	St. Lawrence, NF
2582	VCS	Halifax CG Radio	Halifax, NS
2582	VOJ	Stephenville CG Radio	Stephenville, NF
2582	VOK	Labrador CG Radio	Cartwright, NF
2582	VOK	Labrador CG Radio	Hopedale, NF
2582	VON	St. John's CG Radio	St. John's, NF
2582	VOO	Comfort Cove CG Radio	Comfort Cove, NF
2598	VAU	Yarmouth CG Radio	Yarmouth, NS
2598	VCM	St. Anthony CG Radio	St. Anthony, NF



2598	VCO	Sydney CG Radio	Sydney, NS
2598	VCP	St. Lawrence CG Radio	St. Lawrence, NF
2598	VCS	Halifax CG Radio	Halifax, NS
2598	VOJ	Stephenville CG Radio	Stephenville, NF
2598	VOK	Labrador CG Radio	Cartwright, NF
2598	VOK	Labrador CG Radio	Hopedale, NF
2598	VON	St. John's CG Radio	St. John's, NF
2598	VOO	Comfort Cove CG Radio	Comfort Cove, NF
4376	VOK	Labrador CG Radio	Cartwright, NF
4410.1	VCS	Halifax CG Radio	Halifax, NS
6518.8	VCS	Halifax CG Radio	Halifax, NS
8787.1	VCS	Halifax CG Radio	Halifax, NS
13138	VCS	Halifax CG Radio	Halifax, NS
17242.2	VCS	Halifax CG Radio	Halifax, NS

If you are interested in radiotelex transmissions, the following frequencies of VCS in Halifax might interest you:

4353.0	13090.5
6497.5	17212.5
8708 O	22500.0

The Royal Canadian Navy has its major Atlantic coast base at Halifax, and they broadcast information in CW and rediotelex on a regular basis. Frequencies for CFH include:

438	8697
4255	12726
6430	16926.5

Remember that all of the stations using Morse Code are equipped with 500 kHz, and all of the Single Sideband-equipped stations have 2182 kHz.

Next, for those living in or visiting the area with a scanner, the following are among the VHF frequencies which are used. All stations and all transmitter sites also use 156.800 MHz. Frequencies are megahertz.

156.5500	VAZ 3	Canso Canal Lock
156.5500	VAZ 3	Canso Canal Lock
156.5500	VCA17	St. John's Traffic
156.5500	VCA73	St. John's Traffic
156.5750	XLI71	Fundy Traffic
156.6000	VBJ20	Halifax Traffic
156.6000	VCA73	St. John's Traffic
156.6000	XLI70	Placentia Traffic
156.6000	XLI71	Fundy Traffic
156.6000	XLM44	Port aux Basque Traffic
156.7000	VBJ20	Halifax Traffic
156.7000	XLI70	Placentia Traffic
156.7000	XLI71	Fundy Traffic
156.7000	XLM44	Port aux Basque Traffic
161.6500	VAU	Yarmouth CG Radio
161.6500	VAU	Yarmouth CG Radio
161.6500	VCA	Charlottetown CG Radio
161.6500	VCA	Charlottetown CG Radio
161.6500	VCM	St. Anthony CG Radio
161.6500	VCM	St. Anthony CG Radio
161.6500	VCO	Sydney CG Radio
161.6500	VCO	Sydney CG Radio
161.6500	VCP	St. Lawrence CG Radio
161.6500		
	VCS	Halifax CG Radio
161.6500	VOJ	Stephenville CG Radio
161.6500	VOJ	Stephenville CG Radio
161.6500	VOK	Labrador CG Radio
161.6500	VON	St. John's CG Radio
161.6500	VON	St. John's CG Radio
161.6500	VOO	Comfort Cove CG Radio
161.7750	VCA	Charlottetown CG Radio
161.7750	VAU	Yarmouth CG Radio
161.7750	VAU	Yarmouth CG Radio
161.7750	VCM	St. Anthony CG Radio
161.7750	VCO	Sydney CG Radio
161.7750	VCO	Sydney CG Radio
161.7750	VCP	St. Lawrence CG Radio
161.7750	VCP	St. Lawrence CG Radio
161.7750	VCS	Halifax CG Radio
161.7750	VOJ	Stephenville CG Radio
161.7750	VOK	Labrador CG Radio
161.7750	VON	St. John's CG Radio
161.7750	voo	Comfort Cove CG Radio
161.8000	VAU	Yarmouth CG Radio
161.8000	VAU	Yarmouth CG Radio
161.8000	VAU	Yarmouth CG Radio
161.8000	VAU	Yarmouth CG Radio
	VAU	Yarmouth CG Radio
161.8000 161.8000	VCA	Charlottetown CG Radio
161.8000	VCA	Charlottetown CG Radio
161.8000	VCM	St. Anthony CG Radio
101.0000	· ON	on running Co Radio
161.8000	VCO	Sydney CG Radio
161.8000	VCO	Sydney CG Radio
161.8000	VCP	St. Lawrence CG Radio
161.8000	VCP	St. Lawrence CG Radio
161.8000	VCS	Halifax CG Radio
161.8000	VOJ	Stephenville CG Radio
161.8000	VOK	Labrador CG Radio
161.8000	VON	St. John's CG Radio
	20 1202112	

Canso, NS St. John's, NF St. John's, NF Saint John, NB Halifax, NS St. John's, NF Placentia, NF Saint John, NB Port aux Basque, NF Halifax, NS Placentia, NF Saint John, NB Port aux Basque, NF Western Head, NS Lorneville, NB Charlottetown, PE Pt. Escuminac, NB Pointe Riche, NF Conche, NF Sydney, NS Fox Island, NS St. Lawrence, NF Halifax, NS Pine Tree, NF Ramea Island, NF Goose Bay, NF St. John's, NF Cape Bonavista, NF Comfort Cove, NF Cape Egmont, PE Yarmouth, NS Cape Blomidon, NS l'Anse aux Meadows, NF Cape North, NS Sable Island, NS Cape Pine, NF Fortune Head, NF Ecum Secum, NS Sopers Crossing, NF Cartwright, NF Hearts Content, NF Twillingate, NF Yarmouth, NS Western Head, NS Lorneville, NB Cape Blomidon, NS Grand Manan, NB Charlottetown, PE Cape Egmont, PE l'Anse aux Meadows, NF Cape North, NS St. Columba, NS Cape Pine, NF Fortune Head, NF Ecum Secum, NS Sopers Crossing, NF Cartwright, NF Hearts Content, NF

Canso, NS

MIL-SPEC COMMUNICATIONS

P.O. Box 461 Wakefield, RI 02880 Call Today (401) 783-7106

Military Surplus & New Communications Gear

Covering DC to Daylight at Discount Prices!

■ AR-2515 Wide Coverage Scanner.	\$679
■ AR-2002 Scanner	
AR-900 Scanner w/cellular	\$276
■ ICOM R-71A HF Scanning Receive	er\$850
Collins R390A (Reconditioned/Cali	brated) \$750*
Japan Radio NRD-525	\$1,150
Sony ICF-2010	
■ Sony ICF-2003	
■ Sony Pro-80	\$350
■ RACAL RA-6790 (GM)/R-2174	
Realistic PRO-2005 Scanner	\$399
■ 3TF7 Ballast Tube - Brand New!	\$40
■ Bearcat BC-200XLT - w/Cellular restor • Cost includes Federal Express Shipping	ration\$275

FREE DELIVERY TO YOUR DOOR!

WE OFFER REPAIR SERVICE • MANUALS • BROKERING PROFESSIONAL MONITORING STATION SEND \$2.00 FOR CATALOG CREDITED TO PURCHASE

	161.8000	VOO	Comfort Cove CG Radio	Twillingate, NF
I	161.9000	VAU	Yarmouth CG Radio	Yarmouth, NS
I	161.9000	VAU	Yarmouth CG Radio	Western Head, NS
I	161.9000	VAU	Yarmouth CG Radio	Lorneville, NB
I	161.9000	VAU	Yarmouth CG Radio	Cape Blomidon, NS
ı	161.9000	VAU	Yarmouth CG Radio	Grand Manan, NB
I	161.9000	VCA	Charlottetown CG Radio	Charlottetown, PE
I	161.9000	VCA	Charlottetown CG Radio	Cape Egmont, PE
I	161.9000	VCA	Charlottetown CG Radio	Pt. Escuminac, NB
I	161.9000	VCM	St. Anthony CG Radio	Pointe Riche, NF
I	161.9000	VCM	St. Anthony CG Radio	Conche, NF
I	161.9000	VCO	Sydney CG Radio	Sydney, NS
I	161.9000	VCO	Sydney CG Radio	Fox Island, NS
I	161.9000	VCO	Sydney CG Radio	Kilkenny Lake, NS
I	161.9000	VCP	St. Lawrence CG Radio	St. Lawrence, NF
١	161.9000	VCS	Halifax CG Radio	Halifax, NS
I	161.9000	VCS	Halifax CG Radio	Kingsburg, NS
١	161.9000	VOJ	Stephenville CG Radio	Pine Tree, Tab1 NF
١	161.9000	VOJ	Stephenville CG Radio	Ramea Island, NF
I	161.9000	VOK	Labrador CG Radio	Goose Bay, NF
١	161.9000	VON	St. John's CG Radio	St. John's, NF
I	161.9000	VON	St. John's CG Radio	Cape Bonavista, NF
I	161.9000	VOO	Comfort Cove CG Radio	Comfort Cove, NF
١	161.9500	VAU	Yarmouth CG Radio	Scotch Mountain,
I				NB
	161.9500	VCA	Charlottetown CG Radio	Pt. Escuminac, NB
	161.9500	VCS	Halifax CG Radio	Halifax, NS
	161.9500	VCS	Halifax CG Radio	Ecum Secum, NS

161.9500 VCS

MONITORING TIMES

That's all for this month. Happy hunting until next time.

Halifax CG Radio

March 1990

Kingsburg, NS

43

The Amateur Service

For years the amateurs have been bragging about the public service they provide. Whatever the disaster, hams are there with quick, efficient and life-saving communications. Hurricanes, tornados, floods or earthquakes, hams are there, doing their thing.

Several months later, the ham magazines are filled to overflowing with kudos. Over there are pictures of WX2B5 and his friends smiling from inside a rain-drenched tent. A few pages further are full-length reports on the disaster and how hams saved the day.

You see this sort of thing over and over again. The problem is that all of this great publicity is occurring in the ham magazines, a clear-cut case of preaching to the converted. Sure, we all like to have our fellows give us a nice pat on the back, but the bottom line is that hams spend altogether too much time patting themselves on the back. As a result, the general public knows -- and cares -- little about hams.

The public likes CB

Over the years, I have learned that most folks feel CB serves the public better than hams. They will point out the many coffee breaks that various CB clubs put on during holidays, the volunteer work CBers do with the handicapped and disadvantaged, the crime prevention teams that are manned by CB operators and the excellent traffic reports available on CB -- not to mention the many rescue teams staffed by CB operators.

The reason for all of this is that CBers are regular citizens who are involved with their community. And they are well liked by the press because they are visible and willing to talk like normal people (I know CBers talk funny, but think about it!).

On the other hand, hams like to appear better than CBers, and too often act like snobs. Ask a ham what the difference is between him and a CB operator, and you will hear "Hams have licenses, know all about electronics and can understand Morse code." In addition the ham will go on about the awards he has earned, power he runs and DX worked. Ho hum. John Q Public could care less.

What is needed?

It's time to show a different side of amateur radio. For example, amateur radio provides a springboard for the youth of the world to learn about technology. We have a great opportunity to help ease world tensions and join diverse societies into a cooperating

international community. Amateur radio truly has the potential of easing many of the earth's burdens.

What to do

Almost every ham club has given classes on how to get a ham ticket. That's nice, but what we've already found out is that the general public doesn't give a hoot about ham radio. There is little use putting an ad in the local news paper telling everyone your club is going to give ham classes if there is little or no interest in the hobby. Let's try something different.

What we need is a way of telling our story to everyone (just like the CBers). For example, I am sure that at least 99 percent of the ham clubs in the world has at least one member who can teach the average homeowner how to make simple electrical repairs, or how to put up a good TV antenna. How about telling the local Boy Scout troop how to go about receiving international shortwave stations?

Is it possible for the local ham club to host a coffee break? Could we teach basic electronics, or how about a class for new computer users? Or, how do I use my microwave oven? Anyone care about Solar power?

Not only can we present technology to the public, we could do such wild things as having our resident expert put on classes on fly fishing, wood carving, swimming or anything! Whatever it is, we must get the public's attention and let them know we are out here and willing to help make their life better! Let's be regular people, not snobs!

What's the benefit?

As we all recognize, amateurs are indeed skilled people. We have interests and talents in many areas and there is no reason we cannot use this reservoir of skills to introduce the public at large to the hobby.

Every time we have contact with the public there is an opportunity to tell them who we are and what we do. Let's get their attention and then sell them on hamming. As I have said many times before, we need new amateurs if this hobby is going to progress!

Fantastic Antenna Revisited

Do you recall the two meter quad I mentioned in the October column? A recent letter from the antenna's producer,

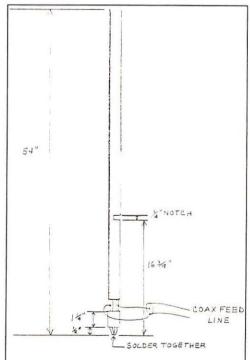
John Dickson, W4NON, informed me of a price increase in the basic five element quad due to material prices being upped. The new price is now \$50.00 plus \$7.00 s/h (in the 48 states). Additional elements are \$5.00 each (up to 8). Even at the fifty dollar price, I know of no other antenna that performs as well in that price range.

I have recently received an additional three elements for my own five element quad and will report on the eight element antenna in an upcoming issue.

This nifty antenna is available from John Dickson, W4NON, 111 Old Hickory Point, Greenville, SC 29607 (other bands/types also available).

Speaking of Two Meter Antennas

Figure one illustrates a nice two meter J antenna. The idea for this antenna has been circulated on packet radio for some time now. It's a good antenna for portable/emergency operation, and if you are looking to save some bucks will do a nice job at the home station, too. Of course the



2-Meter J Antenna

Make antenna from 300 ohm TV twinlead. Tape all exposed wires. This antenna should work well when scaled to other VHF bands.

antenna can be scaled up or down to any other frequency. The following description and information are exactly as received via my local PBBS.

TV Twinlead 2M J pole antenna copied from UUCP:

The following is a description of a J-Pole antenna made from 300 ohm TV twin-lead. Quite a few of the local hams have successfully built one or more of these antennas. The antenna has several advantages which include improved performance for 2 meter HTs, portability, and last, but never least, they are inexpensive.

- Start with 54-1/2 inches of TV twin lead (do not use foam core twinlead).
- Strip 1/2 inch of insulation from the bottom and solder wires together.
- Measure 1-1/4 inches from the soldered end and strip insulation on both sides. This is the connection point for 50 ohm coax feedline.
- Measure 16-3/4 inches from bottom and cut out a 1/4 inch notch on one side.
- Feed with 50 ohm coax. Tape coax at feedpoint for strength and weather protection.

You may add an alligator clip to the plastic at the top (don't short top wires) to hang the antenna from a convenient support. (James Burks, KA5QYV).

Old Sol

The solar flux has been doing some unusual things lately. The flux has dropped to rather low levels recently (about 170). Hopefully, solar activity will begin to smooth out a bit.

WB8SMC/8 Special Event Station

The FAROUT ARC of Dayton, Ohio, will operate a special event station from St. Patrick, Ohio, during the period 1700 UTC March 17, 1990 to 1700 UTC March 18, 1990. St. Patrick, Ohio, is the only town in the U.S.A. with the name of Saint Patrick!

Frequencies will be (\mp 5kHz). RTTY 3620, 7090, 14090, 21090, and 28090. CW 3735, 7135, 14135, 21135, and 28135. SSB 3870, 7270, 14270, 21370, and 28370. (How about some Novice CW freqs? de N3IK)

The FAROUT ARC will QSL 100% to amateurs and listeners alike. Shortwave listeners must indicate who WB8SMC was in contact with at the time of monitoring. To QSL, send an SASE to: FAROUT ARC, P.O. Box 9181, Dayton, OH 45409-9181. For additional information contact Charlie Cotterman KA8OQF, 26, Mello Ave, Dayton, Ohio 45410.

MIR

Recent reports have indicated that QSL cards for contacts with MIR have finally been mailed out. Best information says they have been worth the wait.

There has been no information on when or if MIR will resume operations in the two meter ham band. From all indications there is a great deal of work that must be done to update MIR and the Cosmonauts have been too busy to attempt amateur communications.

AFFORDABLE RTTY-CW-FAX From Universal



The Universal M-900 is just right for the listener who wants an easy-to-use, affordable converter to decode all the basic shortwave transmission modes. The M-900 receives Morse code from ships coastal stations and hams. It also decodes regular (Baudot) RTTY still used by many international press agencies, weather stations and aero concerns. Both Sitor modes are also included to monitor maritime, diplo. and Amtor traffic. The M-900 even provides high resolution FAX images (to printer port only), so you can SEE pictures, maps, photos, and marine charts from around the world. A complete system will require your receiver, a monitor, a 12 VDC power supply and cables. A printer is also required for FAX mode only. Please write for full technical details including special system pricing. The M-900 alone is \$549.95

Universal Radio

1280 Aida Drive Dept. MT Reynoldsburg, OH 43068 Toll Free: 800 431-3939 In Ohio: 614 866-4267 Universal has been serving radio enthusiasts since 1942. We carry all major lines of shortwave and amateur equipment.

52 p. SWL Cat. is \$1 ppd 48 p. HAM Cat. is \$1 ppd

Rites of Spring

Springtime is upon us and it's time to start looking for improved propagation on the VHF/UHF bands. As we move into warmer weather Sporadic E will allow DX on the VHF bands to be worked fairly easily.

The catch to all of this is to know when the $E_{\rm S}$ is occurring. One way of doing this is to use a scanner and set it up with freqs of two meter repeaters not active in your area. Check the repeater directory and program freqs of repeaters that cannot normally be heard; since repeaters are not always active, it pays to punch in as many of the simplex frequencies as your scanner will allow. Then when you start hearing activity you will know something is up.

Circuits

A few years ago I included a schematic for a simple tube type CW rig in "On The Ham Bands." I also made an offer of sending two complete plan sets for simple rigs to anyone interested. Several hundred replies kept me busy for a long time.

If you are interested in seeing more circuits please send a card or note to me c/o *Monitoring Times* in Brasstown. Let me know the type of circuits and era you are interested in. I have many plan sets for rigs from the 20's to modern times and will reproduce them in the column if there is adequate interest.

Additionally I am very interested in receiving circuits and ideas from you. Interesting and functional circuits will be published as time and space allow.

That's all for March gang - see ya next month. 73, Ike, N3IK



AUSTRALIA

Radio Australia, 9580 kHz. Full data "Australian Bicentennial Commemorative" card and personal note from Michael Taft, Correspondence Officer. Received in 21 days for an English report. Station address: P.O. Box 428G, G.P.O. Melbourne, Victoria, Australia. (Nick Terrence, Huntington, NY)

BERMUDA

Bermuda Harbour Station, 87623 kHz. Full data prepared card. Received for a utility report and return postage. Verification signer, A.W. Atwood. Station address: Cable & Wireless Ltd., P.O. Box 151, Hamilton 5, Bermuda. (Fraser Bonnett, Kettering, OH)

CAYMAN ISLANDS

Cayman Brac-*CBC,* 415 kHz. Full data prepared card. Received for a utility report and one US dollar (which was returned). Verification signer, John Foster. Station address: Gerrard Smith International Airport, Airport Officer, Civil Aviation Dept., Cayman Brac, Cayman Islands. (Hank Holbrook, Dunkirk, MD)

ECUADOR

HCJB, 15155 kHz. Full data color card featuring Ecuadorian postage stamps. Verification signer, Glen Voltshadt, Director of Broadcasting. Also received sticker and program schedule. Received in 23 days for an English report and two US mint stamps. Station address: Box 691, Quito, Ecuador. (Robert Hurley, Baltimore, MD)

GHANA

Ghana Broadcasting Corp., 3366 kHz. Full data multicolored QSL card. Verification signer, E. Leneal, for the Director General. Received in 40 days for an English report. Station address: The Propagation Engineer, GBC Monitoring Station, P.O. Box 1633, Accra, Ghana, Africa. (Frank Mierzwinski, Mt. Penn, PA)

ISRAEL

KOL Israel, 11585 kHz. Full data card, program schedule, and station logo, without verification signer. Received in 27 days for an English report. Station address: External Service, P.O. Box 1082, 91 010 Jerusalem, Israel. (Robert Hurley, Baltimore, MD)

JORDAN

Radio Jordan, 9560 kHz. Full data card with an illegible signature. Received in 349 days for an English report. Station address: P.O. Box 909, Amman, Jordan. (Nick Grace, Harvard, MA) (Bill Estes, Huntsville, AL)

MADAGASCAR

Radio Netherland Relay, 17715 kHz. Full data card, without verification signer. Received for an English report and one IRC. Station address: P.O. Box 222, 1200 JG Hilversum, Holland. (Fraser Bonnett, Kettering, OH)

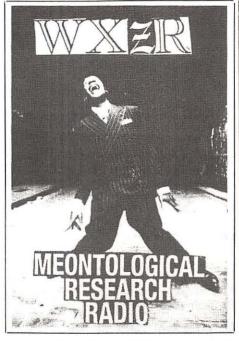
PIRATE

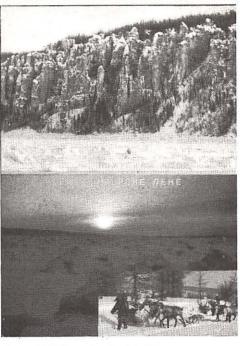
46

Free Radio One, 7415 kHz. Full data QSL letter and information sheets, without verification signer. Received for an English report. Station address: 3434 North Pacific Highway, Medford, Oregon 97501. (Michael Cook, Scarbough, Ontario, Canada)

WXZR, 7435 kHz. Full data card and personal letter from Klaus Kinski, QSL Director. Also







Talk about variety ...! Nick Grace logs both pirate WXZR and Siberia! Here's proof.

received a paper poster and a "styrofoam award." Received in 13 days for an English report and three US mint stamps. Station address: WXZR, P.O. Box 628, Slanesville, West Virginia 25444. (Nick Grace, Harvard, MA)

SHIP TRAFFIC

AEL Europa-DKQP, 500 kHz (container ship). Full data prepared card. Received for a utility report, one IRC, and one US mint stamp. Ship address: Thien & Heyenga Vereederungs Und Begrachtungs, GmbH Radiosen 6, Postfach 106240, D-2000 Hamburg 1, Federal Republic of Germany. (West German ship # 159 QSLed!) (Hank Holbrook, Dunkirk, MD) Bravo, Hank!!-ed.

HMS Newcastle-GQIH, 16463 kHz (Royal Navy Destroyer). Full data prepared form card with ship's stamp and ship fact sheet. Verification signer, Signal Communications Officer. Received in 25 days for an English utility report, souvenir postcard, and return postage (unused). Ship address: c/o BFPO Ships, London, England. (Richard Albright, Merced, CA)

M/S Abitibi Clairborne-DDRC, 16587 kHz (West German newsprint carrier). Full data prepared form card and ship fact sheet. Verification signer, Bertram Guenther, Radio Officer. Received in 38 days for a German utility report, souvenir postcard, and one U.S. dollar for postage. Ship address: c/o Weser Schiffahrts-Agentur GmbH & Co., Langestrasse 22, 2880 Brake, Federal Republic of Germany. (Richard Albright, Merced, CA)

M/V Pharos-DDDQS, 16587 kHz (West German bulk hauler). Full data prepared form card and a zerox photo of the ship. Verification signer Hans-Dieter Boehm, Radio Officer. Received in 28 days for a German utility report and a souvenir postcard. Ship address: c/o F/Laeisz Schiffahrtdgesellschft GmbH & Co., Trostbruecke 1, 2000 Hamburg 11, Federal Republic of Germany. (Richard Albright, Merced, CA)

Sealand Achiever-WPKD, 500 kHz (container vessel). Full data prepared card. Received for a utility report and return postage (US mint stamps). Ship address: Sealand Service, Inc., P.O. Box 800, Iselin, NJ 08830. (Hank Holbrook, Dunkirk, MD)

USS Missouri-NNNOCKK, MARS Station, 14467 kHz, (battleship Maritime Mobile). Full-data yellow QSL card, ship's photo, friendly note and ship fact sheet. Verification signer, Scott. Received in 11 days for an English utility report, souvenir postcard, and return postage (unused). Station address: FPO San Francisco, CA 96689-1120. (Richard Albright, Merced, CA)

SOUTH AFRICA

Radio Five, 4880 kHz. Full data card with dual station logo, without verification signer. Received in 25 days for an English report. Station address: Broadcasting Centre, Auckland Park, Johannesburg 2000, Republic of South Africa. (Frank Mierzwinski, Mt. Penn, PA)

SYRIA

Radio Damascus, 12085 kHz. Full data QSL, and program schedule, without verification signer. Received in 377 days for an English report and one IRC. Station address: Ommayad Square, Damascus, Syria. (Tom Czaja, Mequon, WI)

UNITED KINGDOM

Portishead Marine Radio, 87654 kHz. Partial data QSL. Verification signer, Lawrence Bennett. Received for a utility report and return postage. Station address: BTI Coastal Station, Highbridge, Somerset TA93JY United Kingdom. (Fraser Bonnett, Kettering, OH)

UNITED STATES

New Orleans Coast Guard Comm. Station, 5696 kHz. Full data QSL. Verification signer, Byron E. Croley. Received for a utility report and return postage. Station address: 4640 Urquhart St., New Orleans, Louisiana 70117. (Fraser Bonnett, Kettering, OH)

WOM Pensuco AT&T Radio, 131442 kHz. Partial data QSL card. Verification signer D.D. Bean. Received for a utility report and return postage. Station address: 1350 NW 40th Ave., Fort Lauderdale, Florida 33313. (Fraser Bonnett, Kettering, OH)

WYFR, 5950 kHz. Full data card with station logo and schedule, without verification signer. Received in 12 days for an Enlish report. Station address: 290 Hegenberger Road, Oakland, California 94621. (Robert Hurley, Baltimore, MD)

USSR

Siberia, Radio Yakutsk, 7345 kHz. Full data postcard with a personal note in Russian and a souvenir postcard. Verification signer Aleksandra Borisova. Received in 298 days for one English follow-up report and three souvenir brochures. Station address: Dom Radio, Ordzhonikidze 48, Yakutsk 677812 USSR (Nick Grace, Harvard, MA)

A New Piccolo System

Last year I built equipment to copy a multitone British RTTY system known as Piccolo. This year, for the last several months, I have been looking at a new type of piccolo which I believe is being used by the French. Testing was done on 18,184 and 20,170 kHz (LSB) using piccolo, and a voice (also LSB) was in French from 0400 to about 0900 UTC. (I'm looking for someone who can translate the French.)

One Monitoring Times contributor believes that this new piccolo signal is coming from Cuba. Perhaps a French-speaking embassy? I don't know if the French call it piccolo. But I know one thing! It's not the British system. I came to this conclusion after extensive analysis of the signal.

The system consists of 12 tones (the British use 6, see Figure 1); a low group (tones 1 to 8) and a high group (tones 10 to 12). Tone 9 is an idle tone and is sent at the beginning of the transmission and in between pauses when the operator is "hunting and pecking" for the next key on the teletype.

Simple math is the key to this multitone system. If you multiply the low tone group by the high tone group, you'll come up with 32 and that's the exact number of combinations that are used in standard RTTY.

The French piccolo is asynchronous but has the characteristics of a synchronous system. Standard five unit Baudot, which is used in RTTY, is asynchronous because it has one start bit and one and a half or two stop bits. A synchronous system doesn't have start and stop bits but relies on a clock signal to keep the system timed.

Sometimes the clock signal can be extracted from the data (SITOR mode "B" uses this method). In the French system, the tones alternate from the low group to the high group and that tells the modem which tone is the start tone, which tone is the end tone, and the timing of the signal.

A French piccolo modem would probably work this way:

 Send the first tone from the high group.
 a) The receive end modem will decode it and flag it as the first tone for the first character. Store it and wait for the second tone.

- Send the second tone from the low group.
 a) The receive end modem will decode it and flag it as the second tone for the
 - first character.
 b) Using the first and second tone, go to a lookup table and send the appropriate
 - character to the tty.
 c) Wait for the next tone which will be the first tone of the next character (the high

tone group).

The steps shown above would probably be used in the software of the modem which may have an on-board microprocessor. Of course, this is just speculation. I'm showing it so that you can understand how this system probably works. However, I'm not speculating about the tones. I know which ones are being sent because I have been analyzing the signal using a modified Universal M7000 as a frequency to voltage converter and the Tandy 1000TL computer modified to work as a DC (direct current) storage oscilloscope.

When I was receiving the piccolo signal, the M7000 was set up with a 360 Hz shift. A jack (that I added) on the rear apron of the M7000 which goes to the filter/tone decoder circuit (otherwise known as the FSK detector) was connected to the computer's audio or A to D (audio to digital) circuit. Using the sound software that was supplied with the computer, I was able to display what looks like a DC staircase or step signal (see Figure 2). This was saved on a computer disk. I sent a copy of the disk to a colleague for analysis.

I also copied what I thought were "RYs" being sent during the test. I figured that tones 5, 7, 11, and 12 were being sent. When I gave this information to my colleague, he

came up with a chart which could be the tone to character conversion table. But we aren't sure! As soon as a decoder is built and we can further examine the tones more thoroughly, a more accurate table will be constructed. That depends on whether

or not the data is encrypted. Here's the table.

FIRST	TONE	SENT

	TONE	# 10	11	12	13
	1	?	A	В	C
	2	D	E	F	G
SECOND	3	H	I	J	K
TONE	4	L	M	N	O
SENT	5	P	Q	R	S
	6	T	U	V	W
	7	X	Y	Z	?
	8	?	?	?	?

Notice that in the table above, we don't have the "Letters," "Figures," "space" and the "idle" commands that are normally used in RTTY. That's because we don't know where they fit in the table. Also, notice that RYs fit the table very well. An "R" would be tones 12, 5 and "Y" would be tones 11, 7. The figures such as 1, 2, ?, or bell that is used in normal RTTY would match the same letters in the ITU standard.

Conclusion

With this new discovery, I hope that manufacturers of RTTY equipment (like Infotech, for example) will come up with a unit that can receive the British or French system. Maybe this article will spark some interest and inspire them to develop it so that hobbyists like ourselves can stay on top of the latest technologies.

NNN

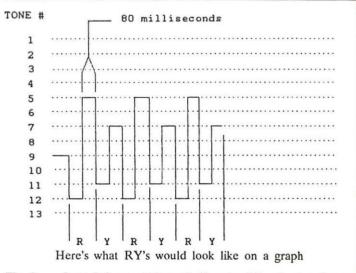


Fig. 2 - I copied something similar to this chart using a Universal M-7000 and an Tandy 1000TL

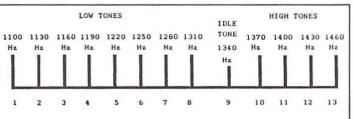


Fig. 1 - The tones used in the French Piccolo system

Videotext via Satellite

Last month we wrote about World System Teletext (WST) which is used by Electra Teletext on G1,18. This type of videotext is displayed by any Zenith television with a built-in decoder and is intended for the cable and home satellite industry.

Are there any other videotext services sent via satellite? You bet! Some of these services are designed for cable distribution only, others are designed for TVRO only and still others are a combination of both.

X-Press X-Change

One of the more technologically intriguing developments in satellite delivered data is offered by X-Press Information Services, Ltd. of Denver, Colorado. The services are called X-Press X-Change (the basic service) and X-Press Executive (the premium service). Delivered via subcarrier on G1 7 and 18, X-Press services are very sophisticated one-way electronic information services providing 24 hour access for a one time software charge and, in the case of Executive, a monthly subscriber fee.

How it works

Whether you sign up for Executive or X-Change, you'll get a kit which includes software, splitter, receiver, RS-232 cable, RF cables, and installation information. The Executive version includes a decoder module which allows one to access specific, and very detailed financial information (more on this later). Using your own IBM, Apple, Atari, or Amiga computer (see chart), you're now ready to receive a bewildering assortment of financial information and news.

X-Change

The basic service gives you financial news headlines and quotes on stocks for all North American exchanges three times a day. In addition, X-Change gives you wire service reports from the U.S., Canada, USSR, PRC, Opec countries, Japan, Mexico (in Spanish), West Germany, France, and Taiwan.

You'll also get sports information on U.S. and Canadian pro and college sports and, as

X-Press Software works with the following computers:

	PC	XT	AT	PS/2
and	100 per-	cent	compa	atibles
			IIC	C IIe
	512K	5121	K Enh	anced
			Plu	s SE
	ST	520	ST 1	040ST
	Mega	ST	Meg	a ST4
		500	1000	2000
	and	and 100 per- 512K ST Mega	and 100 percent 512K 512K ST 520 Mega ST	512K 512K Enh

the brochure says, "...shopping, lifestyles, hardware and software news, entertainment news, TV listings, horoscopes, people, editorials...on-going conferencing on a variety of topics...technical bulletins, user tips, schedules of file transfers..." Whew!

Executive

But that's just the beginning of this service. With the Executive kit you'll get all of the above plus updated information on interest and money rates, mutual fund quotes, stock quotes (on a 15 minute delay), seven daily reports on active and volatile issues, options quotes; commodities and futures quotes; precious metals prices and futures; ten daily updates on global and U.S. business and financial news with reports and commentaries from Business Week Magazine.

There are also customized features which allow you to track up to 128 securities on your "personal portfolio pages. Optional software allows you to set limit alarms to advise you of important price movements..." Clearly, this is an important tool for those who aren't still shell shocked from events of October 1987.

For more information and X-Press TVRO kit prices, call 800-7PC-NEWS.

C-SAT PAD Service

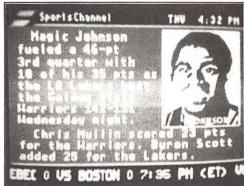
C-SAT, formerly K-SAT, is the grass roots home dish organization which has an audio service on S3,9 6.8 MHz audio. In addition to the audio service, C-SAT transmits Public Access Data (PAD) on the same frequency Thursdays at 11 p.m. ET (300 or 1200 baud); Saturday at 3:30 p.m. ET (300 baud) and Sunday at 5:30 p.m. ET (1200 baud). They also provide a computer bulletin board at 213-947-5307 (300, 1200, 2400 baud).

This PAD service is an excellent way to keep up with home satellite information and news. Topics on the service may range from telecommunication, public domain modem programs, transcripts of legislation and much more.

To receive the PAD service you'll need a computer of any kind, a matching modem for 300 or 1200 baud, communications softwave, and a cable to connect your computer to your modem. This may not be quite as easy as it seems but don't worry, help is on the way. C-SAT offers a manual for receiving the C-SAT PAD which includes instructions on making your own modem-satellite receiver interface cable and how to hook it all together.

For the C-SAT PAD manual send \$5.00 to C-SAT Broadcasting, Inc., 225 W. Loockerman Street, Dover, DE 19901. It's a pretty good price for satellite delivered data.

AP/TMS Information Services



Sports Channel America is just one cable service which carries the AP/TMS Sports Plus for its subscribers. The service is thus available to TVRO users who subscribe to SCA. Note the date and time blocks at top right and scoreboard crawl at bottom.

Long a dominant player in the print media, The Associated Press has steadily strengthened its position in audio and data transmissions by taking advantage of satellite's ability to deliver cheaply to its ever growing communications network.

The AP is not an overnight sensation. It has taken 70 years from the time its first teleprinters clacked away at an astounding 60 WPM (a standard used today in RTTY) to the present high speed data transmission on two pairs of wires at 2,570,000 WPM.

In fact, the AP is so active in the field of satellite-delivered services that for purposes of this article I'll cover just the basics of what the AP offers to cable systems. Details on other services will be covered in a future column.

AP Cable Videotext

AP/TMS is a joint venture of The Associated Press and The Tribune Company of Chicago. The service provides three cabletext services to the cable industry. These are full color graphics enhanced computer generated screens.

Programming is on a thirty minute information cycle and includes:

AP News Plus -- A summary of national and international news with a host of features including weather maps, sports, and business reports.

AP Sports Plus -- Features sports schedules, scores, stories, stats, odds, and a continuous sports score crawl at the bottom of the screen.

AP Business Plus -- Features a NYSE crawl, business news, government reports, market indexes, and a host of other financial reports.

These services are sent to cable systems throughout the country via very small satellite receive-only antennas or by land line and are unavailable to TVRO users.

However, AP Sports Plus is available to TVRO users who subscribe to any of the Sports Channel services. Look to Satcom F4

48

for Sports Channel America (10), Sports Channel New York (7), SportsVision (9), Sports Channel Ohio (11), Sports Channel Florida (16), Sports Channel Los Angeles (17), and Sports Channel New England (23).

A similar service, though not connected to AP/TMS is the computer generated sports news service offered in the mornings by the New England Sports Network (NESN) on F4.13.

MAILBAG

Frank Sonnek, K0JM, of Aberdeen, South Dakota, has a question about signal drift on FM/SCPC when using an ICOM 7000 off the 950-1450 MHz IF of the Block Downconverter.

Frank, I think any drift in that setup would be the fault of the LNB and not the ICOM. As I understand it, all LNBs will exhibit some amount of drift when receiving SCPC. The reason for this is mostly design parameters. These days all LNBs are drift free for video purposes. Any small amount of frequency drift simply won't be seen on the video. For FM/SCPC reception, however, some LNBs will have less drift than others. My thanks also to Frank for sending a clipping of a 21 inch multi-system monitor TV with remote. This set features on-screen display, automatic-off timer, audio/video connections, and handles full color transmissions in PAL and NTSC. Listed price is \$469. For more information on this and a catalog of other hard to find video equipment, call 47th Street Photo at 800-221-3513. This would be a great set to have for watching those BBC broadcasts in PAL on W5,15.

Richard Graham of Fitchburg, Massachusetts, wants to get double duty use from a Realistic Pro 2005 scanner by using it for SCPC

reception as well.

It's a great idea, Richard, but I'm afraid it won't work. The main reason is that what's needed is analog tuning capability for FM/SCPC. The problem is that the scanner tunes through discrete frequencies in steps whereas the ICOM 7000, for example, slides right through the desired frequencies. The second problem is audio quality. Both the Pro 2005 and the ICOM 7000 were designed to provide that familiar non-HiFi audio which is necessary in two-way communications. That's fine if you are listening only to news, but many SCPC fans are there for the music.

The best compromise remains the Heil SC-One which essentially has it all: easy tuning and decent fidelity. Which is not to say it's perfect. In addition, what we would all like to see in the SC-One is a switchable narrower bandwidth filter and a second tuning section for stereo.

TRANSPONDER NOTES

Spacenet 2 has become quite an active satellite with the addition of two impulse pay-perview VCII encrypted channels. Drive-In



Introducing a brand new product, the Super Amplifier ™ is a compact pre-amp designed to work with scanners and it amplifies the reception of the VHF/UHF bands (from 100MHz to 1GHz) as high as 20db. The Super Amplifier™ has an adjustable gain which is controlled from the back of the unit and allows amplification level of up to 20db through all frequencies, equipped with a bypass switch to return to normal scanning frequencies. As with all other GRE products, you will find the quality and design of the Super Amplifier™ to be of the highest standard.

Specifications and Features

• Frequency Range:

100MHz to 1GHz

Adjustable Gain:

0 - 20db

Input:

BNC Connector

Output:

BNC Connector

Power:

9 Volt battery or adapter LED

 Power Indicator: • Dimensions:

68 MM x 34 MM x 37MM

Output Impedance Load: 50 Ohms

Bypass Switch

For more information, or a dealer near you (new dealers are welcome), contact GRE America, Inc. at the address below.



GRE America, Inc.

GRF America, Inc. 425 Harbor Blvd Belmont, California 94002

Telephone (415) 591-1400 Outside CA: (800) 233-5973 Fax: (415) 591-2001

Cinema (1) and Rendezvous (3) are both operated by Graff Communications.

In addition, CNN/Telemundo has been active on 18 with Spanish language news; NBC affiliate, WPTF, in Raleigh, North Carolina, has been on 12. Channel America continues on 5; the ever-popular SCOLA is still on 19 with the USIA and its eclectic schedule of state department briefings, VOA transmissions, and C-SPAN programming on 21. Shipboard Satellite (10) has apparently been scuttled.

Other items of note: Turner Program Services have been active on G2, 4; RAI TV from Italy is seen on F2,20 as well as afternoon transmissions on F3,4. French TV can be found on F2,24.

An article in Satellite Business News suggests renewed interest in Direct Broadcast Satellite (DBS) from several companies. The last such effort was the now defunct USCI service which offered five channels via KU. The report says that one firm, using its own signal compression technology, will launch a 36 channel Ku service utilizing only two Ku channels. Touchtone Video Network is said to be planning a C-Band DBS service on Telstar 303 in conjunction with Uniden Corporation of America. Each of these planned services would use their own scrambling systems which would not be compatible with the current VCII defacto standard.

Something for Everyone



Rising to the top in a hurry -KQAL operations manager Guy Hamernik and program director Cory Malles



"Let's Rap" director Jennifer Lauren and producer Christian Peterson put on a lively show.



"You can do everything up here! There's no limit on what you can do!" Excitement can be felt in every word when Guy Hamernik talks about KQAL. "We have rock shows and jazz shows and classical shows. News, talk, and sports. It's alternative radio!"

Three years ago, as a college freshman, Guy discovered KQAL, and jumped at the opportunity to become a broadcaster. After some basic training off the air, he earned an air slot and soon became Music Director during the summer. Fifty people now work under his leadership as Operations Manager of the station. "The popcorn system," as Guy calls it, "really can send you to the top in a hurry."

KQAL is loaded with ingenuity, enthusiasm, and big smiles. As the voice of Minnesota's Winona State University, it's the source of a collection of diversified programs limited only by the student broadcasters' vivid imaginations. Using an all-volunteer staff and a new 1800-watt transmitter atop a bluff in Garvin Heights, the station can be heard all over Southeast Minnesota and parts of Wisconsin on 89.5 FM. Listeners tune in from up to 75 miles away!

Since it signed on the air on December 13, 1975, KQAL has gone through quite a metamorphosis. Guy tells us: "The station was all rock. It was a traditional juke-box college station. We discovered that when we offer more to the community, we get more back. And we get a lot more listeners!" So the station changed its tune, and the students and the townspeople loved it.

KQAL's sound is as personal as the students who create it. "Our rock is a combination of everything. Our jazz isn't just classical jazz," Guy explains. "We play contemporary jazz and mix in new age music and even reggae and blues." The students learn almost as much in the studios as they do in class.

Besides becoming experienced broadcasters, KQAL volunteers are self-taught musicologists. Guy notices that "The majority of what is played is the disk jockey's choice. The jocks become very alternative minded. You learn a lot by just playing it yourself and experimenting. You develop your own taste." And while the students learn, the audience does too.

Guy is amazed at the station's impact. "Jazz is making a big plus and record companies love us. We've developed new markets for them." Peter Krall, another KQAL staffer concurs: "We're the only station that plays it all. Everything from progressive rock to classical. I love music, and that's why I'm here."

Ambition only begins with the music. Three hours every morning, KQAL produces "Wake Up, Winona," combining local news with national and worldwide events reported by the Associated Press via satellite. Business, agricultural, and sports news are also blended in, along with a variety of music.

Its nighttime companion, "Dateline Winona," wraps up the day, and there's twenty minutes of news at noon, as well. Although the voices may be young, the sound is professional and competitive. Many student voices combine with a variety of other sources to create very impressive and comprehensive coverage of current events.

Tuesday nights at 6:30 p.m., listeners take the air on KQAL's talk show, "Let's Rap." Directed by Jennifer Lauren and produced by Christian Peterson, telephone callers provide exciting, and sometimes loud, feedback about all sorts of issues. Its sister show, "Political Forum," airs Thursday nights at the same time, and takes governmental issues by the horns. Jennifer and Christian love creating very lively, and sometimes controversial, programming responsive to the "Star City" of Winona.

For an international flavor, Germany's Radio Deutsche Welle and Britain's BBC spice up KQAL with transcribed concerts and talk shows. The Longhorn Radio Network from the University of Texas at Austin is also heard on KQAL weekly. Defying categorizations are their ingenious offerings like "Little City in Space." Described as an eye-opening hour of 21st century news, sports, and entertainment from aboard Earth's first orbiting city, it is the only children's TV show for adults on radio.

Exclusive sports coverage of WSU's Warriors is paramount on KQAL, with live broadcasts of football, basketball, baseball, softball, and even high school sports. Sports fans also crave "Saturday Night Scoreboard," combining a tally of weekend game results with telephone call-ins. "The Warrior Show" hands the microphones over to team members each Sunday night.

KQAL Sports Director Rick Thiesse really gets into his Saturday nights on the air with Winona's fans. "On 'Scoreboard' anything goes! We talk with our listeners mostly about pro and college sports, and we make our picks for next week's games. No one else does what we do. All the radio stations in the area just play top 40 or oldies. KQAL is a radio station where you can hear things you've never heard before."

Winona's radio alternative is looking forward to the future, too. Now that their transmission facilities have been upgraded, the next step will be installing two new downlinks to receive satellite delivered entertainment. KQAL is completely remodeling their studios and installing brand new equipment to improve the sound and the station's atmosphere further.

Imagine what you could do with a radio station filled with 50 motivated and daring

broadcasters testing their wings. Turn on KQAL and watch these students fly! Nationwide, there are hundreds of college radio stations on FM between 88 and 92 kHz, each with a personality all its own. Take a listen. You'll probably like what you'll hear!

Bits and Pieces

Broadcasting is about to gain a new dimen-

Be an American

radio in the local

BandScan Reporter.

See any stories about

paper? Send them to

Brasstown, NC 28902.

Bandscan, c/o MT,

P.O. Box 98,

sion. We are all familiar with over-the-air radio and television. The 1980s brought us cable television and radio, providing distant and different signals never seen nor heard before. Now that 1990 is here, are you ready for DCRs?

Digital Cable Radios will probably be the next frontier of broadcasting. What compact disks are to vinyl records, DCRs are to

today's radios. By using a satellite transmitted data stream, you will soon be able to receive packaged music formats, without commercials, in perfect digital quality. Disk jockeys will be extinct, and commercials will be unheard of. You'll be able to hear a new release just like you order a pay-per-view movie today, or you can subscribe to a service, like you do to HBO.

No copyguard scheme is planned, so your DCR hookup will be instantly compatible with your new DAT digital audio tape recorder or your existing analog cassette machine. DCR receivers are already available with up to 98 channels of programming. Broadcast stations will be encouraged to digitize and join the new system, making the offerings almost endless. Sounds like the future will sound really good!

As a twist on a current trend of radio broadcasters using TV newscast audio for their news coverage, two stations in Philadelphia have turned things around. Independent Channel 17, WPHL-TV has signed an agreement with KYW Newsradio 1060 that will allow Channel 17 to televise three 60 minute newscasts produced by KYW radio nightly. In return, Channel 17 will air commercials for KYW newsradio. Turn on your TV and watch the radio!

Mailbag

Can a radio station cause cancer? Marshall Spiller of Glendale, Colorado, sent in an unnerving article from the Denver *Post* about KYGO FM's 100 kilowatt transmitter.

Square dance caller Beryl Main and his wife Maelma lived near the KYGO tower atop Lookout Mountain in Golden, Colorado, for nearly 20 years. Beryl now suffers from a non-Hodgkins lymphoma, and experts say that the cause was prolonged exposure to strong fields of radio frequency energy. The transmitter tower has since been moved to another loca-

tion, and the case is scheduled to be heard in U.S. District Court in Denver.

Similar cases have been noted in San Francisco and Hawaii. The massive Mount Sutro tower, with nine television and four FM stations perched upon it, is said to be the cause of more trouble. The San Francisco Department of Public Health claims that children under fifteen, living in the nearby Noe Valley and Eureka Valley neighborhoods, developed

cancers at twice the expected rate. Significant increases of cancer occurrence were also found in Honolulu residents who lived next to a "hot" tower radiating many transmissions.

Since so little is currently known about the effects of high-intensity radio frequency energy, the issue is shrouded in mystery. Most previous court cases

concerning transmission effects have been secretly settled out of court, with sealed documents, so that no case laws are written setting precedents for future trials. There is no federal safety standard for radio frequency radiation to date.

The BBC and Radio France International can be heard, via satellite, on several American radio stations, and The Voice of America may not be far behind. Herb Gesell of Amityville, New York, mailed us a report from New York's Newsday about a recent U.S. District Court ruling in Des Moines, Iowa.

NBC News President Michael Gartner charged that a federal ban on the dissemination of VOA programming in the U.S. violated the First Amendment. The court dismissed the suit, saying that the ban applies only to VOA's parent, the U.S. Information Agency.

Therefore, although the government cannot distribute VOA programming, nothing is stopping domestic broadcasters from rebroadcasting the shows as they like. Watch for VOA news reports and features in local newscasts in the future.

New Station Grants

These are the frequencies that will activate soon: Lowell, Arizona, 101.9; Tallahassee, Florida, 88.9; St. Simons Island, Georgia, 92.7; Mount Vernon, Indiana, 106.7; Emporia, Kansas, 99.5; Folsom, Louisiana, 104.9; Caledonia, Minnesota, 94.7; Campbell, Missouri, 107.5; LaMonte, Missouri, 97.1; Ogdensburg, New York, 98.7; Winston-Salem, North Carolina, 880; Harrison, Ohio, 104.3; Nyssa, Oregon, 98.7; Charleston, South Carolina, 100.7; Crossville, Tennessee, 102.5; East Ridge, Tennessee, 107.9; Burnet, Texas, 92.5; Johnson City, Texas, 107.9; Fairlawn, Virginia, 890; and Moneta, Virginia, 880. Courtesy of The M Street Journal.

WRTH 90 -- HOT OFF THE PRESS! Save \$4.00

Comprehensive, country-by-country guide to shortwave radio stations around the world. 576 pages include addresses, frequencies, schedules, station IDs, and more. Reg. 19.95. Just \$15.95 + \$1.55 book rate from DX Radio Supply, Box 360, Wagontown, PA 19376.

For Sale

A San Francisco Bay area broadcast school and cable FM network is on the block. This profitable ten-year-old business has lots of expansion potential, with modern studios and offices. The school is approved by the San Francisco Department of Education. Asking price is \$375,000. Call J. Bryan at 415-935-5100.

A full-time mid-Michigan AM is for sale. It's the only station serving a city of 14,000. The building and land are included for an asking price of \$235,000. Contact: M. St. Cyr at 517-487-5986.

Want to start a brand new station? A large AM construction permit is available located in a major market area in the west. When built, it will have tremendous nighttime coverage. Call C. Hall at 801-374-6809.

International Bandscan

The New Zealand government will not require existing radio stations to bid for their own frequencies. Parliament has proposed that these broadcasters maintain their right to operate, as they now do, for the next 20 years.

The BBC World Service is now on the phone in Australia for stations who want to use the service for recording news and features. Those living down under can call 0055-1434 to hear London calling.

La Voz de Nicaragua is still heard on parallel frequencies of 780 and 660 kHz, and can be occasionally received in North America.

Spain's Euskadi Irratia is broadcasting in the Basque language on 1197, 1161, 1072, and 1062 kHz at 0000 GMT daily. Their old frequency of 1296 kHz has been abandoned.

The BBC will launch their new Radio 5 on August 27, 1990, serving all of Great Britain on 693 and 909 kHz, and at the same time Radio 2 will become a VHF FM only service, in stereo, nationwide in the 88 to 90.2 MHz region.

Until next month, happy trails!

mt

Credits: Thanks to the entire cast at KQAL, Winona, Minnesota; Steve McGreevey and Herb Balfour; The Longwave Club of America, and The British DX Club. Radio Worldmagazine and readers Marshall Spiller, Herb Gesell, W. Earl Doan, Ruth Hesch, and Allen Lesser for additional information.

P.O. Box 1116 Highland City, FL 33846

And the Wrath of Judah Was Felt Throughout the Land!

In this case we are not talking ancient Biblical history, folks. Rather we refer to ace pirate chaser Judah Mansbach and his associates in the FCC's New York City office. Mansbach takes his work seriously. He has vowed to get all the New York area pirates. So far he does not appear to be doing too badly.

One pirate told us he knew Mansbach was just waiting for him to go on the air. Had he done so that night, he is sure he would have been located within half an hour. His station may be headed for mothballs, at least for the foreseeable future. We understand, on good authority, others are also getting quite nervous.

The closings last year of Brooklyn-based WHOT and WJPL did much to enhance Mansbach's reputation as the "Pirate Buster." However, WHOT and WJPL have company. Among Mansbach's other trophies in 1989 were WJQR, WRQX, and WMCR. We hear rumors that there may have been others, including at least one New Jersey-based station, while another New York area station, WNYS-AM, appears to have been a recent victim.

In a lengthy article on pirates appearing in the New York Daily News, Mansbach openly boasted of knowing the whereabouts of several stations and then proceded to give reporter Jon Kalish their locations. He threatened one station operator with jail time if caught, claiming he is "an old customer of ours."

Making Mansbach's job easier is the feud that has broken out among some of the stations. According to the Daily News article, "Mansbach admits that a confidential informant aided in the JPL bust."

So, if you happen to be listening to your favorite pirate some evening, and in the background you hear a knock on his door, chances are you are not his only audience. Judah Mansbach and his friends may have also been enjoying the show.

Our thanks to Gregg Allinsen, Herb Gesell, Joe Cieslewicz, Steve from Manhattan (the real one!), and several folks who will have to remain anonymous for their contributions to the above report. Your efforts are deeply appreciated.

And now a Public Service announcement

We have been advised that the famous and faithful Hilo, Hawaii, maildrop has been closed. All stations who used the Hilo drop can be reached via P.O. Box 452, Wellsville, NY 14895. We might also note again that the Beaver Falls, Pennsylvania, drop has been replaced by P.O. Box 628, Slanesville, WV 25444. Recently we heard one station still announcing the old and now incorrect address.

Intrigue, secret stuff, and clandestine matters

A tip of the hat to DX South Florida's Bob Wilkner who managed to log Radio Nacional de Panama on 1015 kHz before, during, and after the American invasion. Bob heard pro-Noriega and Sandinista news, among other things.

Interestingly enough, although there were widespread reports that the transmitter was destroyed by the invading forces, Bob still heard a carrier after the audio had disappeared. It will also be fascinating to see what is ultimately done, if anything, with the shortwave transmitters Cuba was installing for Radio Nacional.

In Connecticut, Bob Thomas got his Panamanian news in a unique way. At 0600 he got extensive coverage of the American military activity on Radio Cultura do Para from Belem, Brazil. This

WNIS-AM Norfolk, Virginia's Pat Murphy is a well-known talkshow host and frequent contributor to "The Outer Limits." Rumor has it the young lady with him is already an expert DXer. She certainly got practice on her numbers during the invasion of Panama! station often puts in a decent signal if not blocked by Radio Impacto.

From Virginia Pat Murphy reports extensive numbers transmissions on 6825 and 6840 kHz during the Panama invasion. These frequencies, long suspected of being used by American intelligence organizations, are normally quiet during weekdays, but sprung to life as Noriega was on the run.

Meanwhile, do not forget the Eastern European situation. You can follow the latest news from Romania around 0200 on 5990. During that country's revolution, Florida's Terry Krueger heard a special multilanguage tape attacking the dreaded dictator Ceausescu, who later was executed by the revolutionary government.

There is still plenty of clandestine activity in various parts of the world. Krueger logged Voice of the Communist Party of Iran on 4480 at 0400. Out in California, Harold Ericson found the El Salvador clandestine Radio Venceremos on 6344 at 0152. David Crawford in Florida writes that pro-Contra Radio Miscut has reactivated on 5560 at 2325 UTC. This one broadcasts to the Indians of eastern Nicaragua. In addition to Spanish, you will hear Miskito and, with some luck, maybe a little English.

We recently reported that the Dominican Republic's Radio Clarin had returned to shortwave on 9950, and was carrying the anti-Castro program La Voz de la Federacion at 0100. After a few days it



TIARE PUBLICATIONS SALE

SWL Forms (10 in all)
List: \$10.00 plus \$2.00 shipping
DX Radio Supply price: 8.00 + .90
Scanner Listeners' Handbook
List: \$14.95 plus \$2.00 shipping
DX Radio Supply price: 13.95 + 1.25
1990 Pirate Radio Directory
List: \$7.95 plus \$2.00 shipping
DX Radio Supply price: 5.99 + .90
Catalogue 25 cents

DX Radio Supply, P.O. Box 360 Wagontown, PA 19376

disappeared. However, we have it on good authority it probably will return, although most likely on a different frequency. So look around, and don't forget to check the morning hours as well as evenings.

The Euro-Scene

Europirates continue to make it across the Atlantic. Terry Krueger got a nice catch in Rainbow Radio, which was running a German and English tape on 6315. Terry had the station for several hours between 0426 and 0730. Rainbow Radio is German operated, but has used transmitter sites in both Germany and France. Krueger may also have had Scottish pirate Radio Stella on 6320 around 0300.

It appears that in Massachusetts, Harold Butcher got himself a Dutch pirate, Pirate Free Broadcasting Service, on 15050 kHz from 0500 to 0730. The station gave the address of P.F.B.S., Box 19074, 3501 AB Utrecht, The Netherlands.

Meanwhile, everybody is hearing Scotland's Weekend Music Radio, and on just about every frequency. Harold found it on 6310, 13690, and 15043. Among other places, Krueger logged them on 6313 and 13630. This writer came across them on 15043 around 0645 UTC, while Pat Murphy found them there at 1330 UTC.

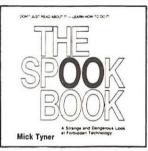
The domestic situation

You do not have to go to Europe to have plenty to hear! Hope Radio International, which also identifies as Hope Radio 16, is being widely reported. Bob Thomas found them on 7410, while Georgia's Bill Frantz, Ohio's Fraser Bonnett, and this writer came across them on 7415. The station now appears to be using the Slanesville drop and possibly a Florida address as well.

Pat Murphy, Terry Krueger, and this writer all found Voice of the North on 15047 around 1900. You can reach this one through Slanesville. Murphy also logged Secret Society Radio on 7412 at 2300. It uses the Baltimore drop: Box 6527, Baltimore, MD 21219.

Fraser Bonnet logged Pirate Radio UK on 7413, while here in central Florida they

STRANGE DANGEROUS FORBIDDEN



PUBLISHED JANUARY 1989, THE SPOOK BOOK DELVES INTO THE WORLD OF FORBIDDEN KNOWLEDGE. NOT A REHASH OF OLD INFORMATION, BUT A FRESH LOOK AT "HOW TO":

- ELECTRONIC SURVEILLANCE
- REARM HAND GRENADES
- AMATEUR ROCKET WEAPONS
- JAMMING RADAR
- TEFLON BULLETS
- DOZENS OF TOPICS

\$34.95 ppd. 8½·x 11, 258 pgs.

SEND \$3.00 FOR CATALOG (FREE WITH ORDER)

DISTRIBUTORS OF:

- NON-LETHAL WEAPONS
- HI TECH ELECTRONICS
- CONTROVERSIAL PUBLICATIONS
- INTELLIGENCE EQUIP. PLANS
- INFECTION CONTROL PRODUCTS
- TOO MUCH TO LIST HERE

SEND CHECK OR MONEY ORDER TO:

ADVANCED ELECTRONIC TECHNOLOGIES

SUITE 173M, 5800-A N. SHARON AMITY RD., CHARLOTTE, NC 28215 PH. (704) 534-2258 FAX (704) 545-9061



being widely reported. Bob Thomas found England's Martin Lester sends along a copy of the QSL issued by British them on 7410, while Georgia's Bill Frantz, pirate Radio 48.

were discovered on 15063. This one appears to be relayed by East Coast Pirate radio, which also logged here on 15063. Try the Baltimore drop for both. Fraser already has an ECPR QSL, and recently received one from the WYMN, which is staffed entirely by women.

Fraser had Free Radio Indiana on 7415 at 0000 UTC, with an address of Box 8, English, IN 47118. He also notes WHBH, Hill Billy Heaven, on 7415 and Voice of Stench on 7410. It appears WHBH does

not like VOS and moved to 7410 in an apparent jamming attempt. Earlier it blocked Hope Radio 16 on 7415.

What else? Terry Krueger got himself an amusing all-Spanish pirate IDing as Radio Mexico. It was using 7425 at 0546 and announcing the Slanesville drop. So, you can see there is truly something for everyone. Happy listening everybody!



Starting Out New

According to my mail, quite a few people use a Sony 2010 as their starting receiver for beacon DXing. For that reason, I felt that my own recent experience

might prove helpful.

I took a trip to southern California. Because I was going to be there for almost two weeks, I thought I should be able to do some DXing. I bought a Sony 2010 to take along. (Actually, I had wanted to get a 2010 for some time, and this was an excellent excuse to go ahead and get it.) Things worked out just about as I had expected and there was ample time for DXing.

I found myself very much in the position of a newcomer to the hobby. I didn't know what I was going to hear on the air, and I didn't know much about the receiver I was using. I was faced with the same double-learning process that every newcomer has

to put up with.

My positive assets were my experience with my home location and other communications receivers, my knowledge of Morse Code, and my reference materials. Fortunately, I had a copy of the brand new 1990 edition of *The Aero/Marine Beacon Guide*, so beacon references were all in a single volume.

Like a newcomer, I turned on the receiver and began to dial up and down the band to see what could be heard. Experience immediately made a contribution. Beacons send Morse code and code is heard better with a tone from a BFO. This means setting the mode for either sideband or code. The 2010 has only two settings: USB and LSB/CW. I chose the USB initially because beacons usually have an upper sideband, even though some have double sidebands. This helped get me started.

The process was simple. Tune up the band starting from about 190 kHz. In some other location, I might have started at 200, but there are some military beacons below 200 kHz in southern California. You may not expect to hear them, but you never know whether this may be the time they are on.

It wasn't the time they were on, but it only cost me a few minutes to learn this. If you gamble those few minutes, every now and then there is a nice payoff of a rare beacon added to your personal list.

When a beacon was heard, I simply moved slowly up the dial as the tone of the beacon dropped lower and lower until it faded away completely. This was the carrier frequency of the beacon. I proved

this by switching to LSB/CW and noticing that the tone became higher as I moved up in frequency. Thus, I could be sure that the fade of the tone was zero-beating the carrier frequency. Now I could note the ID and the frequency and refer to my Beacon Guide to identify that particular beacon.

As expected, most of the beacons were from southern California and primarily

Joe Woodlock finds out how it feels to be a beginner

from the Los Angeles area. However, my very first evening of DXing produced one from Arizona and another from Nevada. That gave me some high hopes that weren't quite realized over the next several days. Except for one from Boise, Idaho, a couple of days later, all the rest were from California.

With the mountains forming a reasonably good block to the east and distances to the west limited by the Pacific Ocean, there wasn't a lot of antenna alignment needed. The antenna was usually set for the north and south directions. In the case of a built-in low-frequency antenna on the 2010, or any other receiver with a built-in antenna, antenna alignment consists of turning the receiver in a circular direction.

The strongest reception is in the direction of the front and back, or the broad side of the built-in loop or rod. The narrower sides are the null points because they are the ends of the built-in rod.

There are three sequenced marine beacons on 302 -- L from Point Loma, O from Point Arguello and V from Point Vicente. Theoretically, they are supposed to rotate through twice in each six minute period. The sequence is supposed to be L at minutes 1 and 4, then V at minutes 2 and 5 and finally O at minutes 3 and 6. I never heard O at all. The other two seemed to wander in their timing and were on simultaneously at one stage.

This did prove the value of antenna

direction. My location in Gardena was just right to null one and get the other at almost maximum sound. By moving the receiver back and forth, I could establish that both were operating at the same time period. Practice nulling a strong station. You may be surprised to find something else on that very same frequency.

If you have infinite time, I suppose you can just go up and down the dial in random fashion and eventually hear most everything that it is possible to hear from your location. I only had ten days, so the process had to be speeded up. I went through the Aero/Marine Beacon Guide and checked the state code. If it was CA (California) I made an additional check of latitude.

What I had heard just tuning the dial suggested that I had a pretty good chance at beacons up to 35 degrees north. So, if the latitude was less than 35 degrees north, I wrote down the frequency and the ID.

There were almost 50 beacons on this list. I cross-checked these against the ones already logged. This identified the ones that would be new catches. I tuned to these frequencies and rotated my receiver (changed antenna direction) slowly as I listened. Several were faint, but they were heard and logged. The net result was seven additional beacons that I might have missed. I also heard two others that weren't on the list. They were from a little further north in California.

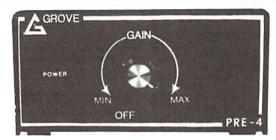
There is only one danger in listening for a specific beacon. Sometimes, because we want to hear a particular beacon so badly, we think we've heard it based on the least little bit of code. Normally, for this reason, I listen on a random basis. I identify the ID and then try to determine if it exists on or near that frequency. If so, I have a new catch; if not, I go back and listen again. Sometimes what I have heard is a combination of parts of the IDs of two more common beacons.

In the case of listening for the possible beacons in California, I made doubly sure that I was hearing the ID properly and completely. There were a couple of other possible catches, but I just wasn't sure of the ID.

If you have a 2010, go beacon hunting. If you are considering one, it can be a good receiver. Put some effort into it, and you will be surprised how lucky you can get with a Sony 2010.

From Grove Enterprises The Leader in Listening Accessor

For Scanning Enthusiasts



GROVE PRE4 SCANNER BOOSTER

Bring in those weak, distant signals with the new Grove PRE4 Scanner Booster. A powerful tool for the serious scanner listener, the PRE4's transistorized, low-noise amplifier adds up to 20 dB of gain to those hard-to-hear signals. A front panel control allows you to customize the amount of amplification. Mounts indoors or out.

Using two scanners? The PRE4 has two jacks for simultaneous operation of any two 25–1300 MHz radios! In-fact, the Grove Scanner Booster is perfect for any scanner, general coverage VHF/UHF receiver – even TV and FM.

The new Grove PRE4 Scanner Booster is now available from Grove Enterprises for \$69.00 plus \$2.00 UPS or \$3.00 parcel post. Requires optional 9–18 VDC/30ma power supply, \$9.95. Interconnect cable(s) for your scanner(s) \$7.50 each. (State model or connector required.)

(Not reccomended in strong signal areas.)



GROVE FTR4 SCANNER FILTER

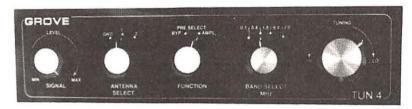
Interference. It's getting to be a real problem. But you don't have to put up with it any more.

Grove's new FTR4 Scanner Filter, equipped with F connectors, can reduce or even eliminate interference—no matter where it's coming from. Customize the settings yourself on the convenient dipswitch. Choose the reject/pass characteristics you need. A switchable 10 dB attenuator reduces RF saturation in dense signal environments while a high-pass filter removes shortwave bleed-through. The FTR4 comes with complete instructions.

The crystal clear 30 to 1000 MHz listening you have always dreamed about is now available!

The FTR4 Scanner Filter is just \$49.00 plus \$2.00 UPS or \$3.00 parcel post. (Scanner interconnect cable required, \$7.50.Specify your model or antenna connector. Input adapters: BNC, \$5.00, Motorola, \$7.50.)

Improve Your Shortwave Reception



THE NEW TUN4 MINITUNER PLUS

Grove Enterprises has taken two of their most popular products and combined them into one. The result is a listening tool so powerful that it improves reception over the entire 100 kHz to 30 MHz range! It's the all new TUN4 from Grove Enterprises!

Tune in that weak station. Then switch on the TUN4's low-noise, high-gain transistor amplifier. Peak the tuning control and hear an astounding improvement in signal strength.

You can also switch the TUN4 between two antennas, two receivers or even remove it from the circuit altogether—all at the touch of a switch. Fine tune your listening with the Grove TUN4. Just \$99.00 plus \$2.00 UPS or \$5.00 parcel post. Requires 12 VDC power supply, \$9.95. (Interconnect cable for your receiver, \$7.50 each. PL259 supplied unless otherwise specified.)

Business Hours: 9am–5pm EST Monday through Friday Orders Only 1–800–438–8155 ● Information 704–837–9200 Send orders to Grove Enterprises ● PO Box 98, Brasstown, NC 28902

Sunday

March 4th, 11th, 18th, 25th

- 0005 Christian Science Monitor: Herald of Christian Science. Religious programming explaining the doctrine of Christian Science.
- 0008 Radio Canada Int'l: Innovation Canada. Bob Cadman looks at Canada's new ideas and technological developments.
- BBC: Composer of the Month. Profiles of great composers and selections from their works.
- 0030 Radio Australia: Book Reading. Serialized readings from popular books.
- Radio Canada Int'l: Coast to Coast. Aldo Marchini looks at opinions of Canadians on issues affecting them.



Aldo Marchini is host to Radio Canada International's "Coast to Coast" and "L'attitude'

- BBC: Play of the Week. Hour-long drama 0101 selections.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- 0108 Radio Canada Int'l (Latin America): Innovation Canada. See S 0008.
- Radio Canada Int'l (United States): Shortwave Listeners' Digest, Ian McFarland presents DX news and features.
- Radio Australia: At Your Request. Dick Paterson plays music requests.
- Radio Canada Int'I: Music Spot. The latest in 0130 popular music.
- Radio Canada Int'l (Latin America): Shortwave 0138 Listeners' Digest. See S 0108.
- Radio Canada Int'l (United States): Spotlight on Science. Bob Cadman examines the latest developments in science and technology.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: British Press Review. Survey of editorial opinion in the British press.
- BBC: Feature. Programming on various subjects.
- 0230 BBC: The Ken Bruce Show. A mix of popular music and entertainment news.
- Radio Australia: Music/Information, Overnight
- music, interspersed with news. Radio Canada Int'l: Listeners' Corner. Ian 0300 MacFarland presents listener comments,
- questions, and music requests. Christian Science Monitor: Herald of Christian Science. See S 0005.
- Radio Australia: Back Page. Brendon Telfer covers sporting issues of the Asian/Pacific
- BBC: From Our Own Correspondent. In-depth news stories from correspondents worldwide.
- BBC: Quiz. A quiz show of a topical nature. Radio Australia: Music/Information. See S
- Radio Canada Int'l: Music. Selections by
- Radio Canada International announcers. Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Feature. Programming on various subjects.
- Radio Australia: Back Page. See S 0313. BBC: Personal View. A personal opinion on
- topical issues in British life. Christian Science Monitor: Herald of Christian
- Science. See S 0005. 0509 BBC: Twenty-Four Hours. Analysis of the
- main news of the day.
 Radio Australia: Music of Radio Australia. 0513
- Selections by Radio Australia announcers.

MT Program Team

Kannon Shanmugam, Program Manager

4412 Turnberry Circle Lawrence, KS 66047

Jim Frimmel

Willow Park, Texas

Dale Vanderpoel

Ft. Lauderdale, Florida

- 0530 BBC: Financial Review. A look back at the financial week
- 0530 Radio Australia: Women of Asia. Patti Orifino speaks with Asian women about their lives and issues affecting them.
- 0540 BBC: Words of Faith. People share how their scripture gives meaning to their lives.
- BBC: Letter from America. Alistair Cooke's distinctly British view of America.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Jazz for the Asking. A jazz music request show.
- 0630 Radio Australia: Australian Country Style, Eric Scott surveys the Australian country music scene.
- 0705 Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Twenty-Four Hours. See S 0509. 0709
- Radio Australia: Music of Radio Australia. See 0713 S 0513
- 0730 BBC: From Our Own Correspondent. See S 0315.
- 0730 Radio Australia: World of Country Music. A look at country music from all around the
- BBC: Book Choice. Short reviews of current or future best-sellers.
- BBC: Waveguide. How to hear the BBC better.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- Radio Australia: Music of Radio Australia. See S 0513.
- 1115 BBC: From Our Own Correspondent. See S 0315.
- 1130 BBC: Composer of the Month. See S 0030.
- 1130 Radio Australia: One World, Michael Wagner reports on environmental issues of the Asian/Pacific region. 1201
- BBC: Play of the Week. See S 0101.
- Christian Science Monitor: Herald of Christian Science, See S 0005.

LEGEND

- The first four digits of an entry are the program start time in UTC.
- The time is followed by the station name, program name, and a brief summary of the program's content.
- Some listings may be followed by "See X 0000." The letter stands for a day of the week:

S=Sunday M=Monday T=Tuesday W=Wednesday H=Thursday F=Friday A=Saturday

The four digits stand for a time in UTC. Listeners should check back to that date and time to find out more about that particular program.

- All broadcasts are listed in chronological order, starting on Sunday at 0000 UTC and ending on Saturday at 2359 UTC.
- All days are in UTC. Remember that if you are listening in North

American prime time, it is actually the next morning UTC. For example, if you are listening to a program at 7:01 pm [EST] on your Thursday night, that's equal to 0001 UTC and therefore Friday morning UTC.

We suggest that you tune in to a program a few minutes before the schedule start time, as some stations have tentative schedules which may slightly vary. We invite listeners and stations to send program information to the program manager at the address above.

- 1208 Radio Canada Int'l: Current Affairs. In-depth news programming.
- Radio Australia: Tattslotto Results. Do you have the winning number? Tune in and find
- Radio Australia: Soundabout. Young, contemporary music from Australia and around the world.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Sports Report. Results and reports on sporting events from the world over.
- 1330 BBC: Sports Roundup. The day's sports news
- 1330 Radio Australia: Music of Radio Australia. See S 0513.
- 1345 BBC: Personal View. See S 0445.
- 1401 BBC: Feature. Programming on various subjects.
- 1404 Radio Canada Int'l: Sunday Morning. A threehour magazine program, covering virtually everything under the sun.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Anything Goes. Sounds from the BBC archives as requested by listeners.
- Radio Australia: Communicator. The latest developments in the media and communications world.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- Radio Australia: Music of Radio Australia. See S 0513
- 1515 BBC: International Recital. A series of concerts from the BBC Concert Hall in London (except March 25th: Concert Hall, classical music performances from the world's great halls).
- 1530 Radio Australia: Education Focus. Education issues of the Asian/Pacific region, with Trevor Robertson.
- 1553 Radio Canada Int'l: Reports/Commentaries. An in-depth look behind the news headlines.
- 1605 Christian Science Monitor: The Sunday Service. A religious service from the First Church of Christ, Scientist, in Boston.
- BBC: Feature. Programming on various subjects.
- Radio Australia: Music of Radio Australia. See S 0513.
- BBC: Letter from America. See S 0545.
- Radio Australia: Sports Report, See S 1313. 1645
- BBC: Words of Faith. See S 0540. 2305
- Radio Canada Int'l: Shortwave Listeners' 2308

- Digest. See S 0108.
- 2310 BBC: Book Choice. See S 0745.
- Radio Australia: Sports Report. See S 1313. 2313
 - BBC: Letter from America. See S 0545. BBC: Feature. See S 1401.
- Radio Australia: Music/Information. See S



The Christian Science Monitor studios in Boston, Massachusetts.

Monday

March 5th, 12th, 19th, 26th

- 0005 Christian Science Monitor: The Sunday Service. See S 1605.
- Radio Canada Int'l: Listeners' Corner. See S 0008 0300
- 0030 BBC: In Praise of God. A half-hour program of worship.
- Radio Australia: Just Out. Rob Hoskin plays recent Australian music releases.
- BBC: Feature. Programming on various subjects.
- 0108 Radio Canada Int'l: Listeners' Corner. See S 0300.
- 0130 Radio Australia: Music/Information. See S 0230.

- 0145 BBC: Musical Feature. A program on a musical topic.
- 0205 Christian Science Monitor (Canada/Central America): The Sunday Service. See S 1605.
- 0206 Christian Science Monitor (East Africa): News Focus. In-depth news analyses focusing on major stories in the news.
- 0209 BBC: British Press Review. See S 0209.
- BBC: Andy Kershaw's World of Music. Exotic and Innovative music from the world over.
- BBC: Science in Action. The latest in scientific developments.
- 0230 Radio Australia: Music/Information. See S
- 0234 Christian Science Monitor (East Africa): Kaleidoscope. News features and special segments on a variety of topics.
- Radio Canada Int'l: L'attitude. Aldo Marchini 0304 presents a look at the arts in Canada.
- 0306 Christian Science Monitor (East Africa): One Norway Street. Current affairs reports from correspondents worldwide.
- 0313 Radio Australia: Sports Report. See S 1313.
- BBC: Good Books. A recommendation of a book to read.
- BBC: Anything Goes. See S 1430.
- Radio Australia: Ring the Bells. Details not available at press time.
- 0334 Christian Science Monitor (East Africa): Letterbox. Staff members respond to listener
- 0404 Radio Canada Int'l: Coast to Coast, Issues and opinions affecting Canadians.
- 0405 Christian Science Monitor (Canada/Central America): The Sunday Service. See S 1605.
- Christian Science Monitor (East Africa): News 0406 Focus. See M 0206.
- 0430 BBC: Off the Shelf. A reading selected from the best of world literature.
- 0430 Radio Australia: Matters of Faith. Dallas Adair examines the doctrines and beliefs of Asian/Pacific faiths.
- 0434 Christian Science Monitor (East Africa): Kaleidoscope. See M 0234.
- 0445 BBC: Talks. Short talks on various subjects. Christian Science Monitor (East Africa): One
- Norway Street. See M 0306. 0509 BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Music of Radio Australia. See 0513 S 0513.
- 0530 BBC: Waveguide, See S 0750.
- Radio Australia: This Australia. Documentaries 0530 about the land "down under".
- 0534 Christian Science Monitor (East Africa): Letterbox, See M 0334.
- 0540 BBC: Words of Faith. See S 0540.

NEWS GUIDE

This is your guide to news broadcasts on the air. All broadcasts are daily unless otherwise noted by brackets. These brackets enclose day codes denoting days of broadcast. The codes are as follows:

- S= Sunday Tuesday
- M= Monday W= Wednesday
- Thursday F= Friday A= Saturday
- We invite listeners and stations to send program information to the program manager.

- 0000 BBC: Newsdesk 0000 Christian Science Monitor: News
- 0000 KVOH: UPI News [T-A] 0000 Radio Australia: International Report
- 0000 Radio Belling: News
- 0000 Radio Canada Int'l:News[S-M];World at 6[T-A] 0000 Radio Havana Cuba: Int'l News [M-A]
- 0000 Radio Moscow: News Radio New Zealand Int'l: News 0000
- Radio Yugoslavia: News Spanish National Radio: News Voice of America: News 0000
- 0000
- 0030
- WWCR: USA Radio News [M-F] 0000 0000 Radio Pyongyang: News Radio Beijing: News About China Christian Science Monitor: News [T-F] 0010 0030 Radio Budapest: News Radio Canada int'i: News [S-M]
 Radio Havana Cuba: Newsbreak [M-A]
 Radio Moscow (World Service): News in Brief 0030 0030 Radio Netherlands: News [T-S] Voice of America (Americas, E.Asia): News (Special English) [T-S] Voice of America (E.Asia): News (Special English) [M]
- 0045 Radio Berlin Int'l; News Spanish National Radio: News Summary [S] 0055 KUSW: News [T-S] 0055 WRNO: ABC News [W-H, A] 0100 BBC: News Summary Belize Radio One: Network News Christian Science Monitor: News Deutsche Welle: World News 0100
- 0100 Kol Israel: News 0100
- KVOH: UPI Radio News [T-A]
 Radio Australia: World and Australian News
 Radio Canada Int'l: News [S-M]
 Radio Havana Cuba: Int'l News [M-A] 0100 0100
- 0100
- Radio Japan: News 0100 Radio Moscow: News 0100 Radio New Zealand Int'l: News
- Radio Prague: News Radiotelevisione Italiana: News 0100 Spanish National Radio: News
- 0100 Voice of America: News Voice of Indonesia: News 0100 WWCR: USA Radio News [T-S]
- Radio Havana Cuba: Cuban Nat'l News [M-A] Christian Science Monitor: News [T-F] 0115 Radio Budapest: News
 - 0130 Radio Havana Cuba: News [M-A]



Radio Australia is bucking the tide -- going for more local emphasis; of the staff MT featured back in 1988, such as these staffers at the international desk, how many remain?

- 0545 BBC: Recording of the Week. A personal choice from the latest classical music releases
- 0606 Christian Science Monitor: News Focus, See M 0206.
- 0630 BBC: Feature. See S 1401.
- 0630 Radio Australia: Music of Radio Australia. See S 0513.
- 0634 Christian Science Monitor: Kaleidoscope. See M 0234.
- 0706 Christian Science Monitor: One Norway Street. See M 0306.
- 0709 BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Pacific Sunrise. Business and export development in the Pacific basin.
- BBC: Feature. See S 1615.
- 0730 Radio Australia: Communicator. See S 1430. 0734 Christian Science Monitor: Letterbox. See M
- 1106 Christian Science Monitor: One Norway
- Street. See M 0306. 1113 Radio Australia: Music of Radio Australia. See
- S 0513.
- BBC: Health Matters. New developments in the world of medical science and fitness. BBC: The Ken Bruce Show. See S 0230.
- Radio Australia: Land and Culture. Indigenous issues in Australia presented by Trevor Robertson.

- 1134 Christian Science Monitor: Letterbox. See M 0334.
- Christian Science Monitor: News Focus. See 1206 M 0206.
- 1215 BBC: Screenplay. A film quiz show hosted by lain Johnstone (except March 26th: Quiz, a quiz show to be announced).
- Radio Australia: Soundabout. See S 1230. 1230 1230 Radio Canada Int'l: North Country. Sports,
- weather, and the stock market report. 1234 Christian Science Monitor: Kaleidoscope. See M 0234
- 1234 Radio Canada Int'l: Innovation Canada. See S
- 1245 BBC: Sports Roundup. See S 1330.
- Christian Science Monitor: One Norway Street. See M 0306.
- Radio Canada Int'l: Current Affairs. In-depth news programming.
- BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Sports Report. See S 1313. 1313
- BBC: Feature. See S 1615. 1330
- 1330 Radio Australia: Music of Radio Australia. See S 0513.
- 1334 Christian Science Monitor: Letterbox. See M 0334
- BBC: Outlook. Conversation, controversy, and 1405 color from Britain and the rest of the world.
- 1406 Christian Science Monitor: News Focus, See M 0206.

- Radio Australia: Stock Exchange Report. Financial news from Sydney and other exchanges.
- BBC: Off the Shelf. See M 0430.
- Radio Australia: Points of Law. Details not available at press time.
- Christian Science Monitor: Kaleldoscope. See M 0234.
- BBC: Feature. See S 0215. 1445
- Christian Science Monitor: One Norway 1506 Street, See M 0306.
- Radio Australia: Pacific Sunrise. See M 0713. 1513
- 1515 BBC: Feature. See M 0101.
- 1530 Radio Australia: Music of Radio Australia. See S 0513
- 1534 Christian Science Monitor: Letterbox. See M 0334.
- 1545 Radio Australia: Word of Mouth. Oral histories of Australians.
- 1606 Christian Science Monitor: News Focus. See M 0206.
- BBC: Good Books. See M 0315.
- BBC: Health Matters. See M 1115. 1630
- Radio Australia: Music of Radio Australia. See
- 1634 Christian Science Monitor: Kaleidoscope. See M 0234.
- 1645 BBC: The World Today. News analysis on a selected location or event in the news.
- 1645 Radio Australia: Sports Report, See S 1313.
- BBC: Commentary. Background to the news 2305 from a wide range of specialists.
- Christian Science Monitor: One Norway 2306 Street. See M 0306.
- Radio Canada Int'l: Current Affairs. See M 1308
- BBC: Financial News. News of commodity 2310 prices and significant moves in currency and stock markets.
- 2313 Radio Australia: Sports Report. See S 1313.
- BBC: Feature. Programming on various subjects.
- BBC: Multitrack 1. Tim Smith presents what's hot on the British pop music charts.
- Radio Australia: Music/Information. See S
- Christian Science Monitor: Letterbox. See M

Tuesday

March 6th, 13th, 20th, 27th

0006 Christian Science Monitor: News Focus, See M 0206.

news guide cont'd from p.57

- 0130 Radio Moscow (World Service): News in Brief 0150 HCJB: News [T-A] 0151 Radio Veritas Asia: World News [M-F]
- Spanish National Radio: News Summary [S]

- 0155 HCJB: News [S] 0155 KUSW: News [T-S] 0155 Radio Veritas Asia: World News [A]
- Voice of Indonesia: News in Brief
- 0200 BBC: World News
- 0200 Christian Science Monitor: News 0200 Deutsche Welle: World News 0200 HCJB: News [M]

- 0200 Kol Israel: News 0200 Radio Australia: International Report 0200 Radio Berlin Int'l: News
- 0200 Radio Bras, Brasilia: News
- 0200 Radio Bucharest: News 0200 Radio Havana Cuba: Int'l News [M-A]
- Radio Kiev: News 0200 Radio Moscow: News
- Radio New Zealand Int'l: News [A-S] 0200
- 0200 Radio RSA: News

- 0200 RAE, Buenos Aires: News 0200 Swiss Radio Int'l: News
- Voice of America: News 0200 Voice of Free China: News and Commentary
- 0200 WWCR: USA Radio News [T-A]
 0215 Radio Cairo: News
 0230 Christian Science Monitor(E.Africa):News [M]
- Christian Science Monitor: News [T-F]
- 0230
- 0230
- Radio Finland: Northern Report [T-A]
 Radio Havana Cuba: Newsbreak [M-A]
 Radio Moscow (World Service): News in Brief
 Radio Pakistan: News (Special English) 0230
- 0230 Radio Portugal: News [T-A]
- 0230
- Radio Tirana, Albania: News Radio Berlin Int'l: News 0245
- 0255 KUSW: News [T-S]

- 0300 BBC: World News 0300 Belize Radio One: News 0300 Christian Science Monitor: News
- 0300 Deutsche Welle: World News
- 0300 HCJB: News [T-A] 0300 Radio Australia: World and Australian News 0300 Radio Beljing: News
- 0300 Radio Canada Int'l: News [M-F]
- 0300 Radio for Peace Int'l: News [T,A] 0300 Radio Havana Cuba: Int'l News [M-A]

- 0300 Radio Japan: News 0300 Radio Moscow: News 0300 Radio New Zealand Int'l: News [A-S]
- Radio Prague: News
- 0300 Voice of America: News 0300 Voice of Free China: News and Commentary
- 0300 WRNO: ABC News [F]
- 0309 BBC: News About Britain 0310 Radio Beijing: News About China
- 0315 Radio Cairo: News
- 0315 Radio France International: News
- Radio Havana Cuba: Cuban Nat'l News [M-A] 0315
- 0330 Christian Science Monitor(E.Africa): News [M]
- 0330 Christian Science Monitor: News [T-F]
 0330 Radio Berlin Int'l: News

- 0330 Radio Havana Cuba: News [M-A] 0330 Radio Moscow (World Service): News in Brief
- 0330 Radio Netherlands: News [T-S] 0330 Radio Tirana, Albania: News
- UAE Radio, Dubai: News 0330
- 0350 Radio Yerevan: News
- 0350 Radiotelevisione Italiana: News
- 0355 KUSW: News [T-S]
- 0400 BBC: Newsdesk 0400 Christian Science Monitor: News
- 0400 Deutsche Welle: World News

BULLETIN BOARD

PUT ANOTHER SHRIMP ON THE RADIO: At a time when radio stations are (thankfully) shifting toward a more worldly approach, Radio Australia has bucked the trend and moved toward more regionally oriented programming.

Their schedule has been completely revamped in the past few months, with music and information programming dominating the "morning" programs (2300-0400 UTC) and features in the "evening" (0400-0800, 1100-2300 UTC).

This increased emphasis on regional programming might make Radio Australia programming of less interest to North American listeners. The new program lineup is included in this month's program guide.

sport, fashion, health, travel, news and views

Radio Canada Int'l: As It Happens. A detailed

look at the people and events making news,

Christian Science Monitor: Kaleidoscope. See

BBC: Short Story. Brief tales written by BBC

Radio Australia: Music/Information. See S

Christian Science Monitor: Letterbox. See M

BBC: Europe's World. A magazine program

Christian Science Monitor: One Norway

BBC: Financial News. See M 2310.

Radio Australia: Music/Information. See S

0030 BBC: Megamix. A compendium of music,

from a Canadian perspective.

BBC: Outlook. See M 1405

Street. See M 0306.

for young people.

0030

0030

0034

0101

0106

0130

0134

0430 Radio Tirana, Albania: News 0445 Radio Berlin Int'l: News

0455 KUSW: News [S, T-F]

0230.

M 0234.

listeners.

VOICE OF AMERICA SHUTS OUT LISTENERS: The Voice of America essentially has cut off subscriptions to "Voice," their program guide. Thus, up-todate details on America's official shortwave stations must be gleaned through hours of painstaking monitoring.

The MT program section is collecting data on the Voice and will present full program information in the near future.

POST ON THE BULLETIN BOARD: If you have information or opinion on shortwave radio programs, we'd love to hear from you. Send your short comments to Kannon Shanmugam at the address on page

- BBC: British Press Review. See S 0209.
- 0215 BBC: Network UK. A look at the issues and events that affect the lives of people throughout the UK.
- BBC: Sports International, Feature program on a topic or person making sports headlines.
- Radio Australia: Music/Information. See S 0230 0230.
- 0234 Christian Science Monitor: Kaleidoscope. See M 0234.
- Christian Science Monitor: One Norway Street. See M 0306.
- 0308 Radio Canada Int'I: Current Affairs. See S 1208
- 0313 Radio Australia: Sports Report. See S 1313. BBC: The World Today. See M 1645.
- BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0330 Radio Australia: Music/Information. See S
- 0334 Christian Science Monitor: Letterbox. See M 0334.
- 0404 Radio Canada Int'l: Innovation Canada. See S 0008.
- 0406 Christian Science Monitor: News Focus See M 0206

- 0430 BBC: Off the Shelf. See M 0430.
- 0430 Radio Australia: World of Country Music, See S 0730.
- Christian Science Monitor: Kaleidoscope, See M 0234.
- BBC: New Ideas. A radio shop window for new products and inventions.
- 0455 BBC: Book Choice. See S 0745.
- Christian Science Monitor: One Norway Street, See M 0306.
- 0509 BBC: Twenty-Four Hours, See S 0509
- Radio Australia: Music of Radio Australia. See 0513 S 0513
- 0530 BBC: Financial News. See M 2310.
- 0530 Radio Australia: Points of Law. See M 1430.
- 0534 Christian Science Monitor: Letterbox. See M 0334.
- 0540 BBC: Words of Faith. See S 0540
- 0545 BBC: The World Today. See M 1645.
- Christian Science Monitor: News Focus, See M 0206.
- BBC: Musical Feature. A program on a musical topic.
- Radio Australia: Music of Radio Australia. See
- Christian Science Monitor: Kaleidoscope, See M 0234.
- Christian Science Monitor: One Norway Street, See M 0306.
- BBC: Twenty-Four Hours. See S 0509.
- 0710 Radio Australia: Music of Radio Australia. See S 0513.
- 0730 BBC: Europe's World. See T 0145.
- 0730 Radio Australia: Monitor. A look at the impact of science and technology on society.
- 0734 Christian Science Monitor: Letterbox. See M 0334
- 0745 BBC: Network UK. See T 0215.
- Christian Science Monitor: One Norway Street. See M 0306.
- Radio Australia: Music of Radio Australia. See S 0513.
- BBC: Waveguide. See S 0750.
- BBC: Book Choice. See S 0745.
- BBC: Megamix. See T 0030.
- Radio Australia: Business Horizons. Peter Hannam reviews business and trade in the Asian/Pacific region.
- Christian Science Monitor: Letterbox, See M 1134 0334.
- Christian Science Monitor: News Focus, See 1206 M 0206
- 1208 Radio Canada Int'l: Current Affairs, See S 1208
- BBC: Multitrack 1: Top 20. See M 2330.
- 1230 Radio Australia: Soundabout. See S 1230.

reflecting life in Europe and its links with other parts of the world. 0200 Radio Canada Int'l: As It Happens. See T 0030 Christian Science Monitor: News Focus. See 0206 M 0206. 0400 H 0400 Ra

	0400	HCJB: News [M-A]		0455	Radio Tanzania: News
	0400	Radio Australia: International Report		0500	BBC: World News
	0400	Radio Beijing: News		0500	Christian Science Monitor: News
		Radio Berlin Int'l: News		0500	Deutsche Welle: World News
		Radio Bucharest: News			HCJB: News [S-M]; Latin American [T-A]
		Radio Canada Int'l: News [M-F]			Kol Israel: News
		Radio Havana Cuba: Int'l News [M-A]			Radio Australia: World and Australian News
		Radio Moscow: News			Radio Havana Cuba: Int'l News [M-A]
		Radio New Zealand Int'l: News			Radio Japan: News
		Radio RSA: News	2000		Radio Moscow: News
		Radio Tanzania: News			Radio New Zealand Int'l: News
		RAE, Buenos Aires; News			Spanish National Radio: News
		Swiss Radio Int'l; News			Voice of America: News
		Voice of America: News			WWCR: USA Radio NEws [T-A]
		WWCR: USA Radio News [M-A]			Radio Havana Cuba: Cuban Nat'l News [M-A
		Radio Pyongyang: News			Christian Science Monitor(E.Africa):News [M]
		Radio Beijing: News About China			Christian Science Monitor: News [T-F]
		Radiotelevisione Italiana: News			Radio Bucharest: News
	0430	Christian Science Monitor(E.Africa):News	[M]		Radio Havana Cuba: News [M-A]
	0430	Christian Science Monitor: News [T-F]		0530	Radio Moscow (World Service): News in Brie
	0430	Radio Havana Cuba: Newsbreak [M-A]		0530	UAE Radio, Dubai: News
		Radio Moscow (World Service): News in	Brief		HCJB: News [T-A]
ı		Radio Netherlands: News [M-A]			Spanish National Radio: News Summary [S]
ı	0400	But The state of t			110.10 11 101

Spanish National Radio: News Summary [S] 0555 HCJB: News [S] 0555 KUSW: News [S, T-F] 0600 BBC: Newsdesk

0600 Christian Science Monitor: News Deutsche Welle: World News 0600 HCJB: News [M]
0600 Radio Australia: International Report
0600 Radio Berlin Int'l: News Radio Havana Cuba: Int'l News [M-A] 0600 Radio Korea: News 0600 Radio Moscow: News 0600 Radio New Zealand Int'l: News Voice of America: News 0605 Radio Pyongyang: News Radio Berlin Int'l: News 0615 Radio Canada Int'l: News [M-F]
Christian Science Monitor: News [M-F] 0615 0630 Radio Finland: Northern Report [T-A] 0630 Radio Havana Cuba: Newsbreak [M-A] 0630 Radio Moscow (World Service): News in Brief 0630 Radio Polonia: News 0630 Radio Tirana, Albania: News 0630 Swiss Radio Int'l: News Radio Bucharest: News 0645 Radio Canada Int'l: News [M-F] 0655 HCJB: News [M-A] 0655 KUSW: News [S] 0700 BBC: World News 0700 BRT, Brussels: News [M-F]

- 1234 Christian Science Monitor: Kaleidoscope. See M 0234.
- 1245 BBC: Sports Roundup. See S 1330.
- 1306 Christian Science Monitor: One Norway Street. See M 0306.
- BBC: Twenty-Four Hours. See S 0509.
- 1313 Radio Australia: Sports Report. See S 1313.
- 1330 BBC: Network UK. See T 0215. Radio Australia: Music of Radio Australia. See
- S 0513.
- Radio Canada Int'l: North Country. See M 1330
- Christian Science Monitor: Letterbox. See M 0334
- Radio Canada Int'l: Shortwave Listeners' Digest. See S 0108.
- 1345 BBC: The Story Lives On. See S 0430.
- 1405 BBC: Outlook. See M 1405.
- Christian Science Monitor: News Focus. See 1406 M 0206
- Radio Australia: Stock Exchange Report. See 1425 M 1425
- 1430 BBC: Off the Shelf, See M 0430.
- Radio Australia: Interaction. An exploration of 1430 the experiences of multicultural Australia, with Nick Kave.
- 1434 Christian Science Monitor: Kaleidoscope. See M 0234.
- BBC: Musical Feature. See M 0145.
- Christian Science Monitor: One Norway 1506 Street. See M 0306.
- 1513 Radio Australia: Music of Radio Australia. See S 0513.
- BBC: A Jolly Good Show. Dave Lee Travis presents listener record requests and dedications, and the UK's top ten albums
- Radio Australia: AgriNews. News about agriculture of the Asian/Pacific region, with Denis Gibbons.
- Christian Science Monitor: Letterbox. See M 0334
- 1553 Radio Canada Inl'I: Reports/Commentaries. See S 1553.
- 1606 Christian Science Monitor: News Focus, See M 0206.
- BBC: Omnibus. A half-hour program on 1615 practically any topic.
- Radio Australia: Music of Radio Australia. See 1630 \$ 0513
- Christian Science Monitor: Kaleidoscope. See 1634 M 0234.
- BBC: The World Today. See M 1645
- 1645 Radio Australia: Sports Report. See S 1313.
- 2305 BBC: Commentary, See M 2305.
- Christian Science Monitor: One Norway Street. See M 0306.



"Health Matters" has become a permanent weekly series on the BBC, news enough to make host Janet Davey smile.

- 2308 Radio Canada Int'l: Current Affairs. See S 1208
- 2310 BBC: Financial News, See M 2310.
- Radio Australia: Sports Report. See S 1313. 2313
- BBC: International Recital (except March 27th: Concert Hall). See S 1515.
- Radio Australia: Music/Information. See S 0230
- Christian Science Monitor: Letterbox. See M 0334

Wednesday

March 7th, 14th, 21st, 28th

- 0006 Christian Science Monitor: News Focus, See M 0206
- 0030 BBC: Omnibus, See T 1615.
- 0030 Radio Australia: Music/Information. See S 0230
- 0030 Radio Canada Int'l: As It Happens. See T

- 0030
- 0034 Christian Science Monitor: Kaleidoscope, See M 0234
- BBC: Outlook. See M 1405. 0101
- Christian Science Monitor: One Norway 0106
- Street, See M 0306. BBC: Financial News. See M 2310. 0125
- 0130 BBC: Feature. Programming on various subjects.
- 0130 Radio Australia: Music/Information. See S
- 0134 Christian Science Monitor: Letterbox. See M
- 0145 BBC: Country Style. David Allan presents
- British country music. Radio Canada Int'l: As It Happens. See T 0200
- 0206 Christian Science Monitor: News Focus, See M 0206.
- 0209 BBC: British Press Review. See S 0209.
- 0215 BBC: Health Matters. See M 1115.
- BBC: Musical Feature. A program on a 0230 musical topic.
- Radio Australia: Book Reading. See S 0030. 0230 Christian Science Monitor: Kaleidoscope. See 0234
- M 0234 0306 Christian Science Monitor: One Norway
- Street. See M 0306.
- Radio Canada Int'l: Current Affairs. See S 0308 1208.
- 0313 Radio Australia: Sports Report. See S 1313.
- BBC: The World Today. See M 1645. 0315
- 0330 BBC: Discovery. An in-depth look at scientific research.
- 0330 Radio Australia: Music/Information. See S 0230
- 0334 Christian Science Monitor: Letterbox. See M
- 0334 0404 Radio Canada Int'I: Shortwave Listeners'
- Digest. See S 0108. 0406 Christian Science Monitor: News Focus. See
- M 0206. BBC: Off the Shelf. See M 0430. 0430
- 0430 Radio Australia: Music of Radio Australia, See
- \$ 0513
- 0434 Christian Science Monitor: Kaleidoscope. See M 0234.
- 0445 BBC: Country Style. See W 0145.
- Christian Science Monitor: One Norway 0506 Street. See M 0306.
- 0509 BBC: Twenty-Four Hours. See S 0509. 0513
- Radio Australia: Music of Radio Australia. See 0530 BBC: Financial News. See M 2310.

Voice of America: News Radio Moscow (World Service): News in Brief

Radio Australia: Education Focus. See S

Radio Netherlands: News [M-A]

1100 Radio Beijing: News 1100 Radio Finland: Northern Report [T-F]

1100 Radio Moscow (World Service): News 1100 Radio New Zealand Int'l: News

1100 Trans World Radio, Bonaire: News [M-F] 1100 Voice of America: News

1110 Belize Radio One: News Summary [T-F]

1110 Radio Beijing: News About China

Radio Pakistan: News (Special English)

Christian Science Monitor; News [M-F] Deutsche Welle; World News

Radio Australia: World and Australian News

1000 Swiss Radio Int'l: News

1030 UAE Radio, Dubai: News

KUSW: News [S]

BBC: World News

Kol Israel: News

Radio Japan: News

Radio RSA: News

1109 BBC: News About Britain

Swiss Radio Int'l; News

1100 Radio Korea: News

Radio Berlin Int'l: News

1000

1030

1030

1045

1055

1100

1100 1100

1100

1100

1100

news guide cont'd from p.59

- 0700 Christian Science Monitor: News
- 0700 Radio Australia: World and Australian News 0700 Radio Havana Cuba; Int'l News [M-A] 0700 Radio Japan; News
- 0700 Radio Moscow: News
- 0700 Radio New Zealand Int'l: News [A-S]
- 0700 Radio Tirana, Albania: News 0700 Voice of Free China: News and Commentary 0715 Radio Havana Cuba: Cuban Nat'i News [M-A]
- 0730 Christian Science Monitor; News [M-F]
 0730 Radio Havana Cuba; News [M-A]
 0730 Radio Moscow (World Service); News in Brief
- 0730 Radio Netherlands: News [M-A] 0755 KUSW: News [S] 0800 BBC: World News
- Christian Science Monitor: News
- 0800 Radio Australia: International Report 0800 Radio Finland: Northern Report [T-S]
- 0800 Radio Korea: News 0800 Radio Moscow (World Service): News 0800 Voice of Indonesia: News 0805 Radio Pyongyang: News

- 0830 Christian Science Monitor: News [M-F] 0830 Radio Finland: Northern Report [T-S]
 0830 Radio Moscow (World Service): News in Brief Radio Netherlands: News [M-A] 0830
- Swiss Radio Int'l: News 0845 Radio Berlin Int'l: News
- KUSW: News [S] Voice of Indonesia: News in Brief 0855 0855
- BBC: World News
- BRT, Brussels: News [M-F] Christian Science Monitor: News 0900 0900
- Deutsche Welle: World News Radio Australia: World and Australian News 0900
- 0900 Radio Japan: News Radio Moscow (World Service): News 0900 Radio New Zealand Int'l: News
- Christian Science Monitor: News [M-F] Radio Moscow (World Service): News in Brief KUSW: News [S] 0930 0930
- 0955 **BBC: News Summary**
- Christian Science Monitor: News Radio Australia: International Report 1000 1000
- 1000 Radio Berlin Int'l: News 1000 Radio Moscow (World Service): News 1000 Radio New Zealand Int'l: News
- 1000 Radio Tanzania: News MONITORING TIMES

- 0534 Christian Science Monitor: Letterbox. See M
- BBC: Words of Faith. See S 0540.
- BBC: The World Today. See M 1645. 0545
- 0606 Christian Science Monitor: News Focus, See M 0206
- 0630 BBC: Meridian. The world of the arts. including music, drama, and books.
- 0630 Radio Australia: Ring the Bells. See M 0330.
- 0634 Christian Science Monitor: Kaleidoscope. See M 0234
- 0706 Christian Science Monitor: One Norway Street See M 0306
- 0709 BBC: Twenty-Four Hours. See S 0509.
- 0713 Radio Australia: Music of Radio Australia. See S 0513.
- 0730 BBC: Development '90. Aid and development
- 0730 Radio Australia: Land and Culture. See M
- Christian Science Monitor: Letterbox. See M
- 1106 Christian Science Monitor: One Norway Street. See M 0306.
- Radio Australia: Music of Radio Australia. See S 0513.
- 1115 BBC: Country Style. See W 0145.
- 1130 BBC: Meridian, See W 0630.
- Radio Australia: Science File. Science, 1130 medicine, and technology news for the Asian/Pacific region.
- 1134 Christian Science Monitor: Letterbox. See M 0334
- Christian Science Monitor: News Focus. See 1206 M 0206
- 1208 Radio Canada Int'l: Current Affairs. See S 1208.
- 1215 BBC: Musical Feature. A program on a musical topic
- BBC: The Farming World. Issues in agriculture
- Radio Australia: Tattslotto Results. See S
- Radio Australia: Soundabout. See S 1230.
- 1234 Christian Science Monitor: Kaleidoscope. See M 0234.
- 1245 BBC: Sports Roundup. See S 1330.
- Christian Science Monitor: One Norway 1306 Street. See M 0306.
- BBC: Twenty-Four Hours. See S 0509. 1309
- Radio Australia: Sports Report. See S 1313. 1313
- 1330 BBC: Development '90. See W 0730.
- 1330 Radio Australia: Just Out. See M 0030.
- 1330 Radio Canada Int'I: North Country. See M
- 1334 Christian Science Monitor: Letterbox. See M

- 0334.
- Radio Canada Int'l: L'Attitude. See M 0304.
- BBC: Outlook, See M 1405. 1405
- Christian Science Monitor: News Focus, See 1406 M 0206.
- Radio Australia: Stock Exchange Report, See 1425 M 1425
- 1430 BBC: Off the Shelf, See M 0430.
- Radio Australia: Innovations, Desley Blanch reports on inventions and innovative practices.
- Christian Science Monitor: Kaleidoscope. See 1434 M 0234
- BBC: Business Matters. See W 0430. 1445
- Christian Science Monitor: One Norway Street. See M 0306.
- 1513 Radio Australia: Music of Radio Australia. See S 0513.
- BBC: Feature. See M 2315.
- BBC: Comedy Feature. A program of well, comedy! (except March 28th: Two Cheers for March, a satirical look back at the month just
- 1530 Radio Australia: Matters of Faith, See M 0430.
- 1534 Christian Science Monitor: Letterbox. See M 0334.
- 1553 Radio Canada Int'l: Reports/Commentaries. See S 1553
- Christian Science Monitor: News Focus. See 1606 M 0206
- 1615 BBC: Musical Feature. See T 0630.
- Radio Australia: Music of Radio Australia. See S 0513
- 1634 Christian Science Monitor: Kaleidoscope. See M 0234
- 1645 BBC: The World Today. See M 1645.

- 1645 Radio Australia: Sports Report. See S 1313.
- 2305 BBC: Commentary. See M 2305.
- Christian Science Monitor: One Norway 2306 Street, See M 0306.
- 2308 Radio Canada Int'l: Current Affairs, See S 1208
- 2310 BBC: Financial News, See M 2310.
- Radio Australia: Sports Report. See S 1313. 2313
- 2315
- BBC: Good Books. See M 0315. BBC: Multitrack 2. Graham Bannerman 2330 presents new pop music records, interviews, news, and competitions.
- 2330 Radio Australia: Music/Information. See S 0230
- 2334 Christian Science Monitor: Letterbox. See M

Thursday

March 1st,8th,15th,22nd,29th

- 0006 Christian Science Monitor: News Focus. See M 0206.
- 0030 BBC: You Asked For It (except March 1st, 29th: Two Cheers...). See W 1530.
- 0030 Radio Australia: Music/Information. See S 0230.
- 0030 Radio Canada Int'l: As It Happens. See T
- 0030 0034 Christian Science Monitor: Kaleidoscope. See M 0234.
- 0101 BBC: Outlook. See M 1405.
- Christian Science Monitor: One Norway 0106 Street See M 0306
- BBC: Financial News. See M 2310. 0125



The English language staff at Radio Canada International (L to R): David Smith, Bob Caman, Jim Craig, Gillian MacConnack, Ian McFarland.

- 1120 Belize Radio One: News Summary [A] 1125 Belize Radio One: News Summary [M]
- Christian Science Monitor: News
- 1130 Radio Moscow (World Service): News in Brief
- 1130 Radio Netherlands: News [M-A] 1152 Radio RSA: News in Brief
- KUSW: News [S]
- 1200 BBC: News Summary [S]; Newsreel [M-A]
- 1200 Christian Science Monitor: News [M-F] 1200 Radio Australia: International Report
- 1200 Radio Beijing: News

- 1200 Radio Berlin Int'l: News 1200 Radio Bucharest: News 1200 Radio Canada Int'l: News 1200 Radio Finland: Northern Report [T-F]
- Radio Moscow (World Service): News
- 1200 Radio New Zealand Int'l: News 1200 Radio Polonia: News
- 1200 Radio Tashkent: News
- 1200 Radio Yugoslavia: News
- 1200 Swiss Radio Int'l: News 1200 Voice of America: News

- 1200 Voice of America: News 1210 Radio Beijing: News About China 1230 BRT, Brussels: News [M-S] 1230 Christian Science Monitor: News 1230 Radio Berlin Int'l: News

- 1230 Radio France Int'l: News
- Radio Moscow (World Service): News in Brief Radio Polonia: News 1230
- 1230 Trans World Radio, Bonaire: News [M-A]
- BBC: World News Belize Radio One: News 1300
- 1300
- Christian Science Monitor: News
 Christian Science Monitor: News [M-F]
 Radio Australia: World and Australian News
 Radio Bucharest: News 1300
- 1300
- Radio Canada Int'l: World Report [M-F] 1300 Radio Finland: Northern Report [T-A]
- 1300
- 1300
- Radio Moscow (World Service): News Radio RSA: News Radio Tanzania: News [A-S] 1300
- Trans World Radio, Bonaire: News [S] Voice of America: News WWCR: USA Radio News [M-F] 1300 1300
- Radio Pyongyang: News Radio Berlin Int'l: News 1305
- 1325
- HCJB: News [M-F] Christian Science Monitor: News [M-F] 1330
- Radio Moscow (World Service): News in Brief 1330
- Swiss Radio Int'i: News
- 1330 UAE Radio, Dubal: News 1330 Voice of America: News (Special English)

MONITORING TIMES

- 1345 Radio Berlin Int'l: News
- 1352 Radio RSA: News In Brief
- BBC: Summary [A-S]; Five-Minute News [M-F] 1400
- 1400 Christian Science Monitor: News 1400 Radio Australia: International Report
- 1400 Radio Beijing: News
- 1400 Radio Berlin Int'l: News
- 1400 Radio Canada Int'I: News [S] 1400 Radio France International: News
- Radio Japan: News 1400
- 1400 Radio Korea: News
- 1400 Radio Moscow (World Service): News
- 1400 Radio Peace and Progress: News 1400 Radio RSA: News
- 1400 Voice of America: News
- 1400 WWCR: USA Radio News [M-F] 1405 Radio Finland: Northern Report [T-A] 1405 Radio Pyongyang: News

- 1410 Radio Beijing: News About China
 1425 HCJB: News [M-F]
 1430 Christian Science Monitor: News [M-F]
 1430 Radio Moscow (World Service): News in Brief
 1430 Radio Moscow (World Service): News in Brief
- 1430 Radio Polonia: News
- 1430 Radio Prague: News 1445 Radio Berlin Int'l: News

- 0130 BBC: Waveguide. See S 0750.
- Radio Australia: Music/Information. See S 0130 0230
- Christian Science Monitor: Letterbox. See M 0134 0334.
- 0140 BBC: Book Choice. See S 0745.
- 0145 BBC: Society Today. A weekly look at the changes in Britain.
- 0200 Radio Canada Int'l: As It Happens. See T
- 0206 Christian Science Monitor: News Focus. See M 0206.



Barry Clarke and Brian Hadden of Australia's English Service.

- 0209 BBC: British Press Review. See S 0209.
- 0215 BBC: Network UK. See T 0215.
- BBC: Assignment. Examinations of current 0230 topical issues.
- Radio Australia: Music/Information. See S 0230 0230
- Christian Science Monitor: Kaleidoscope. See M 0234
- Christian Science Monitor: One Norway 0306 Street. See M 0306.
- Radio Canada Int'l: Current Affairs. See S 1208
- 0313 Radio Australia: Sports Report. See S 1313.
- BBC: The World Today. See M 1645. 0315 BBC: Screenplay (except March 29th: Quiz). 0330 See M 1215
- 0330 Radio Australia: Music/Information. See S 0230
- 0334 Christian Science Monitor: Letterbox, See M 0334.

- 0404 Radio Canada Int'l: L'attitude. See M 0304.
- 0406 Christian Science Monitor: News Focus. See M 0206
- BBC: Off the Shelf. See M 0430. 0430
- 0430 Radio Australia: Music of Radio Australia. See \$ 0513
- Christian Science Monitor: Kaleidoscope. See 0434 M 0234
- BBC: Andy Kershaw's World of Music. See M 0445 0215.
- 0506 Christian Science Monitor: One Norway Street. See M 0306.
- BBC: Twenty-Four Hours. See S 0509. 0509
- Radio Australia: Music of Radio Australia. See 0513 S 0513.
- 0530 BBC: Financial News. See M 2310
- 0530 Radio Australia: AgriNews. See T 1530.
- 0534 Christian Science Monitor: Letterbox. See M 0334.
 - BBC: Words of Faith. See S 0540.
- 0540 BBC: The World Today. See M 1645. 0545
- Christian Science Monitor: News Focus. See
- 0630 BBC: Musical Feature. See W 1215.
- 0630 Radio Australia: At Your Request. See S 0130.
- 0634 Christian Science Monitor: Kaleidoscope. See M 0234.
- BBC: The Farming World. See W 1225. Christian Science Monitor: One Norway 0640 0706 Street See M 0306.
- 0709 BBC: Twenty-Four Hours, See S 0509.
- Radio Australia: Music of Radio Australia. See 0713 S 0513.
- 0730 BBC: Mediawatch. Keith Hindell monitors developments in communications.
- 0730 Radio Australia: Science File. See W 1130.
- 0734 Christian Science Monitor: Letterbox. See M
- 0745 BBC: Network UK. See T 0215.
- Christian Science Monitor: One Norway 1106 Street. See M 0306.
- Radio Australia: Music of Radio Australia. See S 0513
- BBC: New Ideas. See T 0445. 1115
- 1125 BBC: Book Choice. See S 0745.
- 1130 BBC: Serial. A reading from a book of interest.
- 1130 Radio Australia: AgriNews. See T 1530. Christian Science Monitor: Letterbox. See M 1134
- 0334.
- 1206 Christian Science Monitor: News Focus. See M 0206.
- 1208 Radio Canada Int'l: Current Affairs. See S 1208
- 1215 BBC: Multitrack 2. See W 1830.

- 1230 Radio Australia: Soundabout, See S 1230.
- 1234 Christian Science Monitor: Kaleidoscope. See M 0234.
- 1245 BBC: Sports Roundup. See S 1330.
- Christian Science Monitor: One Norway 1306 Street. See M 0306.
- BBC: Twenty-Four Hours. See S 0509. 1309
- 1313 Radio Australia: Sports Report. See S 1313.
- BBC: Network UK. See T 0215. 1330
- Radio Australia: Music of Radio Australia. See 1330 S 0513.
- 1330 Radio Canada Int'l: North Country. See M 1330.
- 1334 Christian Science Monitor: Letterbox, See M. 0334
- Radio Canada Int'l: Spotlight on Science. See 1334 S 0138
- 1345 BBC: Folk in Britain/Jazz Scene UK. A look at folk or jazz music on the British Isles.
- 1405 BBC: Outlook. See M 1405.
- Christian Science Monitor: News Focus. See 1406 M 0206.
- 1425 Radio Australia: Stock Exchange Report. See M 1425.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Australia: Monitor. See T 0730.
- 1434 Christian Science Monitor: Kaleidoscope, See M 0234.
- 1445 BBC: Mediawatch. See H 0730.
- Christian Science Monitor: One Norway 1506 Street. See M 0306
- 1513 Radio Australia: Music of Radio Australia. See S 0513.
- BBC: The Pleasure's Yours. Gordon Clyde 1515 presents classical music requests.
- 1530 Radio Australia: Business Horizons. See T
- 1130. 1534 Christian Science Monitor: Letterbox. See M
- 0334. Radio Canada Int'l: Reports/Commentaries. 1553
- See S 1553.
- 1606 Christian Science Monitor: News Focus. See M 0206. 1615
- BBC: Assignment. See H 0230.
- Radio Australia: Music of Radio Australia. See 1630 S 0513.
- 1634 Christian Science Monitor: Kaleidoscope, See M 0234. 1645
- BBC: The World Today. See M 1645.
- Radio Australia: Sports Report. See S 1313. 1645
- BBC: Commentary. See M 2305. Christian Science Monitor: One Norway 1605
- 2306 Street, See M 0306.
- Radio Canada Int'l: Current Affairs. See S 2308 1208
- 2310 BBC: Financial News. See M 2310.

news guide cont'd from p.61

- 1500 BBC: Newsreel
- 1500 Belize Radio One: News [M-A]
- 1500 Christian Science Monitor: News 1500 Deutsche Welle: World News 1500 Radio Australia: World and Australian News
- 1500 Radio Beijing: News 1500 Radio Bucharest: News 1500 Radio Japan: News
- 1500 Radio Moscow (World Service): News
- 1500 Radio RSA: News 1500
- Voice of America: News WHRI: News [M-A] WWCR: USA Radio News 1500 1505 Radio Pyongyang: News
- 1510 Radio Beijing: News About China 1525 HCJB: News [M-F] 1526 Radio Veritas Asia: World News [M-A]
- 1530 BRT, Brussels: News [M-S]
- Christian Science Monitor: News [M-F] Deutsche Welle: African News [M-F] Radio Moscow (World Service): News in Brief 1530
- 1530 Radio Prague: News

- 1530 Radio Tirana, Albania: News
- 1530 Swiss Radio Int'l: News Radio Berlin Int'l: News 1545
- 1545 Radio Canada Int'l: News
- Radio RSA: News in Brief 1600 BBC: World News
- Christian Science Monitor: News Deutsche Welle: World News 1600 1600
- Radio Australia: International Report 1600 1600 Radio France International: News
- 1600 Radio Korea: News 1600 Radio Moscow (World Service): News 1600 Radio Polonia: News
- 1600 Radio Portugal: News [M-F] 1600 Radio Tanzania: News
- Voice of America: News 1600 1600 WWCR: USA Radio News [M-F] 1609 BBC: News About Britain
- HCJB: News [M-F] Christian Science Monitor: News [M-F] 1625 1630 Radio Moscow (World Service): News in Brief
- 1630 Radio Netherlands: News [M-A] 1630 Radio Peace and Progress: News
- 1630 Radio Polonia: News 1630 UAE Radio, Dubai: News

- 1630 Voice of America (except Africa): News (Special English)
- 1645 Radio Berlin Int'l: News 1655 KUSW: News [M-F]
- BBC: World News [S-F]; News Summary [A]
- 1700 Belize Radio One: News [M-F] 1700 Christian Science Monitor: News
- Radio Australia: World and Australian News 1700 Radio Japan: News
- 1700 Radio Moscow (World Service): News Voice of America: News 1700
- 1705 Radio Pyongyang: News 1715 Radio Canada Int'l: News
- 1730 BRT, Brussels: News 1730 Christian Science Monitor: News [M-F] 1730 Radio Bucharest: News
- 1730 1730 Radio Moscow (World Service): News in Brief
- 1730 Radio Prague: News 1730 RAE, Buenos Aires: News Swiss Radio Int'l: News 1730
- 1755 KUSW: News [M-A] BBC: Newsdesk Belize Radio One: Headline News [M-A] 1800
- 1800 Christian Science Monitor: News 1800 Kol Israel: News 1800 Radio Australia: International Report
- MONITORING TIMES

- 2313 Radio Australia: Sports Report. See S 1313.
- 2315 BBC: Music Review. Classical music events and developments from around the world.
- Radio Australia: Music/Information. See S 0230.
- Christian Science Monitor: Letterbox. See M 0334

Friday

March 2nd,9th,16th,23rd,30th

- Christian Science Monitor: News Focus. See
- BBC: Musical Feature. Programming on various musical subjects
- Radio Australia: Music/Information. See S
- 0030 Radio Canada Int'l: As It Happens. See T
- 0034 Christian Science Monitor: Kaleidoscope. See M 0234.
- 0101 BBC: Outlook. See M 1405.
- Christian Science Monitor: One Norway 0106 Street. See M 0306.
- BBC: Financial News. See M 2310.
- BBC: Folk in Britain/Jazz Scene UK. See H 0130 1345
- 0130 Radio Australia: Music/Information, See S. 0230
- 0134 Christian Science Monitor: Letterbox, See M. 0334
- 0145 BBC: The Learning World. A look at news, views, and ideas of those involved with education.
- Radio Canada Int'l: As It Happens. See T 0200 0030
- 0206 Christian Science Monitor: News Focus. See M 0206
- 0209 BBC: British Press Review. See S 0209. BBC: Seven Seas. A weekly program about 0215
- ships and the sea.
- 0230 BBC: Serial. See H 1130.
- Radio Australia: Music/Information. See S 0230 0230.
- Christian Science Monitor: Kaleidoscope. See 0234
- Christian Science Monitor: One Norway 0306 Street, See M 0306.
- Radio Canada Int'l: Current Affairs. See S 1208
- Radio Australia: Sports Report. See S 1313.
- BBC: The World Today. See M 1645.

David Allan hosts "Country Style" on the BBC.



- Radio Australia: Music/Information. See S 0330 0230
- 0334 Christian Science Monitor: Letterbox, See M 0334
- 0404 Radio Canada Int'l: Spotlight on Science. See S 0138
- 0406 Christian Science Monitor: News Focus, See M 0206
- BBC: Off the Shelf. See M 0430. 0430
- 0430 Radio Australia: Music of Radio Australia. See S 0513
- 0434 Christian Science Monitor: Kaleidoscope. See M 0234
- 0445 BBC: Folk in Britain/Jazz Scene UK. See H 1345
- 0506 Christian Science Monitor: One Norway Street. See M 0306.
- 0509 BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Music of Radio Australia. See
- BBC: Financial News. See T 0125.
- Radio Australia: Interaction. See T 1430.
- Christian Science Monitor: Letterbox. See M
- 0540 BBC: Words of Faith. See S 0540.
- BBC: The World Today. See M 1645. 0545
- Christian Science Monitor: News Focus. See 0606 M 0206.
- BBC: Meridian. See W 0630. 0630
- Radio Australia: Music of Radio Australia. See 0630 S 0513.
- Christian Science Monitor: Kaleidoscope. See 0634 M 0234
- 0706 Christian Science Monitor: One Norway Street, See M 0306.
- BBC: Twenty-Four Hours. See S 0509. 0709
- Radio Australia: Music of Radio Australia. See 0713 S 0513.
- 0730 BBC: Feature. Programming on various subjects, particularly of historical importance.
- 0730 Radio Australia: Innovations, See W 1430,
 - Christian Science Monitor: Letterbox. See M 0334.

- Christian Science Monitor: One Norway 1106 Street, See M 0306.
- Radio Australia: Music of Radio Australia. See S 0513
- BBC: The Learning World. See F 0145.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Australia: Education Focus. See S 1530.
- 1134 Christian Science Monitor: Letterbox. See M 0334
- Christian Science Monitor: News Focus. See M 0206
- Radio Canada Int'l: Current Affairs. See S 1208
- 1208.
- 1215 BBC: Feature. See F 0730.
- Radio Australia: This Australia. See M 0530. 1230
- Christian Science Monitor: Kaleidoscope, See 1234 M 0234.
- BBC: Sports Roundup, See S 1330. 1245
- Christian Science Monitor: One Norway 1306 Street. See M 0306.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Sports Report. See S 1313. 1313
- BBC: John Peel, See T 0330. 1330
- Radio Australia: Music of Radio Australia. See 1330 S 0513.
- 1330 Radio Canada Int'l: North Country. See M
- 1330. 1334 Christian Science Monitor: Letterbox. See M
- 0334.
- 1334 Radio Canada Int'l: Coast to Coast. See S 0038.
- 1405 BBC: Outlook. See M 1405.
- Christian Science Monitor: News Focus. See M 0206
- Radio Australia: Stock Exchange Report. See 1425 M 1425
- BBC: Off the Shelf, See M 0430,
- Radio Australia: Land and Culture. See M 1430
- Christian Science Monitor: Kaleidoscope. See 1434 M 0234.
- BBC: Talks. See M 0445.
- Christian Science Monitor: One Norway 1506 Street. See M 0306.
- Radio Australia: Music of Radio Australia. See 1513 S 0513.
- 1515 BBC: Music Review, See H 2315.
- Radio Australia: Science File. See W 1130. 1530
- Christian Science Monitor: Letterbox. See M 1534 0334.
- Radio Canada Int'l: Reports/Commentaries. See S 1553.
- Christian Science Monitor: News Focus. See M 0206
- 1615 BBC: Science in Action. See M 0230.

2000 Kol Israel: News

2100 BBC: News Summary

2100 Belize Radio One: News [M-F]

0330	BBC: Focus on Faith. Comment and discussion on the major issues in the worlds	0734	Christian Science Monitor: Letter 0334.
	Radio Bras, Brasilia: News		Deutsche Welle: World News
1800	Radio Canada Int'l: News		HCJB: Latin American News [M-F
	Radio Kiev: News		Radio Australia: World and Austra
	Radio Korea: News		Radio Canada Int'l: News [M-F]
	Radio Moscow (World Service): News		Radio Havana Cuba: Int'l News [f
	Radio RSA: News		Radio Japan: News
	Radio Tanzania: News		Radio Moscow (World Service): N
	Voice of America: News		Radio New Zealand Int'l: News
	WWCR: USA Radio News [A]		Radio Portugal: News [M-F]
1803	Radio Jamahiriya, Libya: News Headlines		Radio RSA: News
	Radio Berlin Int'l: News		Radio Tanzania: News
	Belize Radio One: Network News		Spanish National Radio: News
	Christian Science Monitor: News [M-F]		Voice of America: News
	Radio Finland: Northern Report [M-F]		Christian Science Monitor: News
1830	Radio Kuwait: News	1930	Radio Berlin Int'l: News
1830	Radio Moscow (World Service): News in Brief	1930	Radio Bucharest: News
1830	Radio Netherlands: News [M-A]		Radio Budapest: News
1830	Radio Polonia: News	1930	Radio Canada Int'l: News [M-F]
1830	Radio Yugoslavia: News	1930	Radio Havana Cuba: Nat'l News [
1830	Swiss Radio Int'l: News		Newsbreak [W-A]
1830	Voice of America: News (Special English)	1930	Radio Moscow (World Service): N
1847	Radio Jamahiriya, Libya: News	1935	Radiotelevisione Italiana: News
1852	Radio RSA: News In Brief	1950	HCJB: News [M-F]
	KUSW: News [M-F]	1955	KUSW: News [M-A]
1900	BBC: News Summary		BBC: World News
	Christian Science Monitor: News	2000	Christian Science Monitor: News

1900 Deutsche Welle: World News HCJB: Latin American News [M-F] 1900 Radio Australia: World and Australian News 1900 Radio Canada Int'l: News [M-F] 1900 Radio Havana Cuba: Int'l News [M-A] 1900 Radio Japan: News 1900 Radio Moscow (World Service): News 1900 Radio New Zealand Int'l; News 1900 Radio Portugal: News [M-F] 1900 Radio RSA: News 1900 Radio Tanzania: News 1900 Spanish National Radio: News Voice of America: News 1930 Christian Science Monitor: News [M-F] 1930 Radio Berlin Int'l: News 1930 Radio Bucharest: News Radio Budapest: News 1930 Radio Canada Int'l: News [M-F] 1930 Radio Havana Cuba: Nat'l News [M-T]; Newsbreak [W-A] Radio Moscow (World Service): News in Brief

2000 KVOH: UPI News [S] 2000 Radio Australia: International Report 2000 Radio Havana Cuba: Int'l News [M-A] 2000 Radio Jordan: News 2000 Radio Moscow (World Service): News 2000 Radio New Zealand Int'l: News Radio Polonia: News 2000 2000 Radio RSA: News Voice of America: News Voice of Indonesia: News Radio Pyongyang: News Radio Berlin Int'l: News 2000 2005 Radio Havana Cuba: Cuban Nat'l News [M-A] 2025 Radiotelevisione Italiana: News Christian Science Monitor: News [M-F] 2025 2030 Radio Havana Cuba: News [M-A] Radio Korea: News Radio Moscow (World Service): News in Brief Radio Netherlands: News [M-A] 2030 2030 2030 Radio Berlin Int'l: News 2052 Radio RSA: News in Brief KUSW: News [M-A] Voice of Indonesia: News in Brief 2055

- 1630 Radio Australia: Music of Radio Australia. See S 0513.
- 1634 Christian Science Monitor: Kaleidoscope. See M 0234.
- 1645 BBC: The World Today. See M 1645.
- Radio Australia: Sports Report. See S 1313. 1645
- BBC: Commentary. See M 2305. 2305
- Christian Science Monitor: One Norway Street. See M 0306.
- Radio Canada Int'I: Current Affairs. See S 2308
- 2310 BBC: Financial News. See M 2310.
- 2313 Radio Australia: Music/Information. See S 0230
- BBC: Worldbrief. A roundup of the week's 2315 news headlines and human-interest happen-
- 2330 BBC: Multitrack 3. Sarah Ward surveys the British contemporary music scene.
- 2330 Radio Australia: At Your Request. See S 0130
- Christian Science Monitor: Letterbox. See M 2334 0334.

Saturday

March 3rd,10th,17th,24th,31st

- 0005 Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: From the Weeklies. A review of the 0030 weekly British press.
- 0030 Radio Australia: Word of Mouth. See M 1545.
- 0030 Radio Canada Int'l: As It Happens. See T
- 0045 BBC: Recording of the Week. See M 0545.
- 0101 BBC: Outlook. See M 1405.
- 0105 Christian Science Monitor: Herald of Christian Science. See S 0005.
- 0125 BBC: Financial News. See M 2310.
- 0130 BBC: Feature. Programming on various subjects.
- 0130 Radio Australia: Interaction. See T 1430.
- 0145 BBC: Book Choice. See S 0745.
- 0150 BBC: New Ideas. See T 0445.
- Radio Canada Int'l: As It Happens. See T
- 0205 Christian Science Monitor: Herald of Christian Science. See S 0005.
- 0209 BBC: British Press Review. See S 0209.
- BBC: Network UK. See T 0215.
- BBC: People and Politics. Background to the British political scene.
- Radio Australia: This Australia. See M 0530.

- 0300 Radio Canada Int'l: Innovation Canada. See S 0008.
- 0305 Christian Science Monitor: Herald of Christian Science. See S 0005.
- Radio Australia: Music/Information. See S
- BBC: The World Today. See M 1645.
- Radio Canada Int'I: Shortwave Listeners' 0325 Digest. See S 0108.
- 0330 BBC: The Vintage Chart Show, Paul Burnett presents top ten hits from the music charts of vestervear.
- 0350 Radio Canada Int'l: Music Spot. See S 0130. Christian Science Monitor: Herald of Christian 0405
- Science. See S 0005.
- BBC: Here's Humph! All that jazz with Humphrey Lyttelton.
- 0430 Radio Australia: Business Horizons. See T 1130
- 0445 BBC: Personal View. See A 0030.
- 0505 Christian Science Monitor: Herald of Christian Science. See S 0005.
- 0509 BBC: Twenty-Four Hours. See S 0509.
- Radio Australia: Music of Radio Australia. See S 0513.
- 0530 BBC: Financial News. See M 2310.
- Radio Australia: Arts Roundabout. Arts in Australia, past and present.
- 0540 BBC: Words of Faith. See S 0540.
- BBC: The World Today. See M 1645.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio Australia: Just Out. See M 0030.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Twenty-Four Hours, See S 0509. 0709
- 0713 Radio Australia: Music of Radio Australia. See S 0513.
- 0730 BBC: From the Weeklies. See F 2315.
- 0730 Radio Australia: One World, See S 1130.
- 0745 BBC: Network UK. See T 0215.
- Christian Science Monitor: Herald of Christian Science, See S 0005.
- 1113 Radio Australia: Music of Radio Australia. See S 0513.
- BBC: Feature. See A 0130. 1115
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Australia: Matters of Faith. See M 0430.
- 1205 Christian Science Monitor: Herald of Christian Science. See S 0005.
- 1208 Radio Canada Int'l: Current Affairs. See S 1208
- 1215 BBC: Multitrack 3. See F 2330.
- Radio Australia: Tattslotto Results. See S

SUGGESTIONS? SOMETHING MISSING?

Let us know your corrections, additions, and suggestions of what you'd like to see to Program Manager Kannon Shanmugam at 4412 Turnberry Circle, Lawrence, Kansas 66047.

- 1230 Radio Australia: Ring the Bells. See M 0330.
- BBC: Sports Roundup. See S 1330.
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Radio Australia: Sports Report. See S 1313.
- 1330 BBC: Network UK. See T 0215.
- Radio Australia: Music of Radio Australia. See 1330 S 0513.
- 1345
- BBC: Short Story. See T 0130. BBC: The Ken Bruce Show. See S 0230. 1401
- Christian Science Monitor: Herald of Christian 1405 Science. See S 0005.
- 1430 BBC: Sportsworld. Saturday sports, including a preview of English and Scottish soccer matches.
- 1430 Radio Australia: Women of Asia. See S 0530.
- 1505 Christian Science Monitor: Herald of Christian Science. See S 0005.
- 1513 Radio Australia: Music of Radio Australia. See
- 1515 BBC: Sportsworld. Saturday sports, including direct reports from more than a dozen key soccer contests.
- 1530 Radio Australia: One World. See S 1130.
- Radio Canada Int'l: Reports/Commentaries. See S 1553
- Christian Science Monitor: Herald of Christian Science. See S 0005.
- BBC: Sportsworld. Commentary on an 1615 English or Scottish soccer match.
- Radio Australia: Music of Radio Australia. See 1630 S 0513.
- Radio Australia: Sports Report. See S 1313. 1645
- BBC: Words of Faith. See S 0540. 2305
- Christian Science Monitor: Herald of Christian 2305 Science, See S 0005.
- 2308 Radio Canada Int'l: Innovation Canada. See S 0008
- 2310 BBC: Book Choice. See S 0745.
- 2313 Radio Australia: Back Page. See S 0313.
- 2315 BBC: A Jolly Good Show. See T 1515.
- 2330 Radio Australia: Music/Information. See S 0230.

news guide cont'd from p.63

- 2100 BRT, Brussels: News
- 2100 Christian Science Monitor: News
- 2100 Deutsche Welle: World News
- 2100 KVOH: UPI Radio News 2100 Radio Australia: World and Australian News 2100 Radio Bucharest: News
- 2100 Radio Finland: Northern Report [M-F]
- 2100 Radio Japan: News 2100 Radio Moscow (World Service): News Radio New Zealand Int'l: News
- 2100 Radio Peace and Progress: News 2100 Radio Yugoslavia: News 2100 Spanish National Radio: News
- 2100 Swiss Radio Int'l: News
- 2100 Voice of America: News 2130 Christian Science Monitor: News [M-F]
- 2130 KVOH: UPI Headline News
- 2130 Radio Budapest: News
- 2130 Radio Canada Int'l: News 2130 Radio Moscow (World Service): News in Brief
- Swiss Radio Int'l; News
- 2155 KUSW: News [M-F]

- 2200 BBC: Newshour
- 2200 Christian Science Monitor: News
- 2200 KVOH: UPI Radio News
- 2200 Radio Australia: International Report 2200 Radio Berlin Int'l: News
- Radio Canada Int'l (Asia): News 2200
- 2200 Radio Canada Int'l (Western Europe): News
- [A-S]; The World at Six [M-F] Radio Havana Cuba: Int'l News [M-A] 2200
- 2200 Radio Moscow (World Service): News Radiotelevisione Italiana: News
- RAE, Buenos Aires: News 2200
- 2200 Voice of America: News
- Voice of Free China: News and Commentary
- 2230 Christian Science Monitor: News [M-F] Kol Israel: News 2230
- KVOH: UPI Headline News
- Radio Havana Cuba: Cuban Nat'l News [M-A] Radio Moscow (World Service): News in Brief 2230 2230
- 2230 Radio Polonia: News
- Radio Tirana, Albania: News 2230 Voice of America: News (Special English) Radio Berlin Int'I: News
- 2245 KUSW: News [M-A]
- 2300 BBC: World [A-S]; Five-Minute News [M-F]

- 2300 Belize Radio One: News [M-F]
- 2300 Christian Science Monitor: News 2300 KVOH: UPI Radio News
- 2300 Radio Australia: World and Australian News 2300 Radio Canada Int'i; News
- Radio for Peace Int'l: News [F]
- 2300 Radio Japan: News 2300 Radio Moscow: News
- 2300 Voice of America: News
- 2300 Voice of Turkey: News 2305 Radio Polonia: News
- Radio Pyongyang: News BRT, Brussels: News 2305
- 2330 Christian Science Monitor: News [M-F]
- KVOH: UPI Headline News Radio for Peace Int'l: News [M] 2330
- 2330 Radio Jamahiriya, Libya: News
- 2330 Radio Kiev: News
- 2330 Radio Korea: News 2330 Radio Moscow (World Service): News in Brief
- 2330 Radio Tirana, Albania: News
- 2335 Voice of Greece: News [S] 2355 KUSW: News [M-A] 2355 WRNO: ABC News [F]

MT Monitoring Team

Greg Jordan, Frequency Manager

7009 Brandemere Lane, #1 Winston-Salem NC 27106-2846

Richard A. Keen

Colin Miller Ontario, Canada

Larry Miller Pennsylvania

frequency

Radio Beijing, Beijing, China

Radio Canada International, Montreal 5960 9755

0000-0100

0000-0100

	60
	0
	6
7	47
	(mbo
	0
	Street,

17795 21740

15130 17715 17855

0000-0100 0000-0100 Radio Luxembourg, Junglinster 0000-0100 6090 Palto Loxembourg, Junglinster 12005 11800 15170 15295 15420 17570 17610 17655 17775 21690 21790 17890 0000-0100 Radio Sofia, Bulgaria 0000-0100 15330 11680 Palto Tonga, Kingdom of Tonga Palto Tonga, Kingdom of Tonga 0000-0100 5030V Palto Tonga, Kingdom of Tonga Palto Histoga, Palto Tonga, Palto		0000 0100	riadio odriada interrialional, montrea	0000	0.00		
Radio Moscow World Service, USSR 7135 7370 9510 9790 9815 12005 11800 15170 15295 15420 17570 17610 17655 17775 21690 21790 17690		0000-0100	Radio Havana Cuba	11820			
9815 12005 11800 15170 15295 15420 17570 17610 15295 15420 17570 17610 17695 17775 21690 21790 17690 17690 17695 17775 21690 21790 17690 17690 15330 11680 11690 11690 11690		0000-0100	Radio Luxembourg, Junglinster	6090			
15295 15420 17570 17610 17655 17775 21690 21790		0000-0100	Radio Moscow World Service, USSR	7135	7370	9510	9790
17655 17775 21690 21790 17890 17890 17890 15330 11680 15350 11690 15340 11695 1160 15340 11695 1160 15340 11695 1160 15340 11695 1160 15340 11695 1160 15340 11695 1160 15340 11695 1160 15425 17690 15340 11695 1160 15425 17690 11695 1160 15425 17690 11695 11760 15425 17690 117720 15425 17690 1				9815	12005	11800	15170
0000-0100 Radio Sofia, Bulgaria 15330 11680 0000-0100 Radio Tonga, Kingdom of Tonga 5030v 0000-0100 Spanish Natlonal Radio, Madrid 9630 11880 0000-0100 Voice of America-Americas Service 5995 9775 9815 11580 11740 15205 0000-0100 Voice of America-Caribbean Service 6130 9455 11695 0000-0100 Voice of America-East Asia Service 7120 9770 11760 15185 15290 17735 17820 0000-0100 WHRI, Noblesville, Indiana 7315 9495 0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 17875 0030-0055 BRT, Brussels, Belgium 9925 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 0030-0100 T-S Radio Budapest, Hungary 6110 9520 9835 11910 15160 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'I, Hilversum 6020 6165 15315 0035-0100 Radio for Peace Int'I, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 Radio Korea, Seoul, South Korea 15575				15295	15420	17570	17610
0000-0100 Radio Sofia, Bulgaria 15330 11680 0000-0100 Radio Tonga, Kingdom of Tonga 5030v 0000-0100 Spanish National Radio, Madrid 9630 11880 0000-0100 Voice of America-Americas Service 5995 9775 9815 11580 0000-0100 Voice of America-Caribbean Service 6130 9455 11695 0000-0100 Voice of America-East Asia Service 7120 9770 11760 15185 15290 17735 17820 15290 17735 17820 0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0030-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, England 5965 5975 6005 6175 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 7310 9685 9720 12050 0030-0100				17655	17775	21690	21790
National Radio Tonga, Kingdom of Tonga S030V				17890			
0000-0100		0000-0100	Radio Sofia, Bulgaria	15330	11680		
0000-0100		0000-0100	Radio Tonga, Kingdom of Tonga	5030v			
0000-0100	- 1	0000-0100		9630	11880		
0000-0100 Voice of America-Caribbean Service 6130 9455 11695 0000-0100 Voice of America-East Asia Service 7120 9770 11760 15185 0000-0100 WHRI, Noblesville, Indiana 7315 9495 0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WRNO Worldwide, Louisiana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0030-0105 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 11955 15260 15360 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 0030-0100 Radio Moscow N. American Service 6000 6045 7115 715	- 1	0000-0100	Voice of America-Americas Service	5995	9775	9815	11580
0000-0100 Voice of America-East Asia Service 7120 9770 11760 15185 0000-0100 WHRI, Noblesville, Indiana 7315 9495 0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WRNO Worldwide, Louisiana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belglum 9925 9925 9580 9590 9915 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 9835 11950 1560 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 1560 0030-0100 Radio Moscow N. American Service 6000	- 1			11740	15205		
0000-0100 WHRI, Noblesville, Indiana 7315 9495 0000-0100 WINB, Red Lion, Pennsylvania 15145 9495 0000-0100 WRNO Worldwide, Louislana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belgium 9925 9925 6005 6175 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11795 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 9765 15180 0030-0100	- 1	0000-0100	Voice of America-Caribbean Service	6130	9455	11695	
0000-0100 WHRI, Noblesville, Indiana 7315 9495 0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WRNO Worldwide, Louisiana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belglum 9925 9030 9925 9500 9915 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11750 11955 15260 15360 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 9	- 1	0000-0100	Voice of America-East Asia Service	7120	9770	11760	15185
0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WRNO Worldwide, Louisiana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belgium 9925 9925 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 11955 15260 15360 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605				15290	17735	17820	
0000-0100 WINB, Red Lion, Pennsylvania 15145 0000-0100 WRNO Worldwide, Louisiana 7355 0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belgium 9925 9925 9580 9590 9915 11750 11950 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 0030-0100 T-S Radio Budapest, Hungary 6110 9520 9835 11910 15160 7400 9765 15180 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 11690 117690 15425 17605 17700 0030-0100 Radio Moscow N. American Service 6000 6045 </th <th></th> <th>0000-0100</th> <th>WHRI, Noblesville, Indiana</th> <th>7315</th> <th>9495</th> <th></th> <th></th>		0000-0100	WHRI, Noblesville, Indiana	7315	9495		
0000-0100				15145			
0000-0100 WWCR, Nashville, Tennessee 15690 0000-0100 WYFR, Okeechobee, Florida 5985 9505 15440 0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, England 5965 7145 11945 15280 0030-0055 BRT, Brussels, Belgium 9925 5975 6005 6175 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 9580 9590 9915 11750 11955 15260 15360 15360 15230 15230 15230 15230 15230 15230 15230 15230 15230 15260 15360 15360 15230 15230 15230 15230 15230 15250 15360 15360 1545 1560 15360 1545 1560 15360 1545 1560 15360 1545 1560 15360				7355			
0000-0100 0004-0015 WYFR, Okeechobee, Florida 8 Radio Nacional, Venezuela 0030-0045 5985 8 P505 11695 9505 7145 7145 11850 7145 11945 11945 15280 11945 15280 11945 15280 11945 15280 11945 15280 11945 15280 11945 15280 11945 15280 11955 15280 11955 15260 15280 11750 11955 15260 15360 15360 11955 15260 15360 15360 11955 15280 15230 11910 11955 15280 15360 15360 15230 11910 15230 11910 15230 11910 15230 1560 15360 1560 15360 1560 15360 1560 15360 1560 1560 1560 1560 1560 1570 1560 1560 1570 1560 156		0000-0100		15690			
0004-0015 S Radio Nacional, Venezuela 5020 9540 11695 11850 0030-0045 BBC English by Radio, London, Eng 6195 7145 11945 15280 0030-0055 BRT, Brussels, Belgium 9925 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 16230 0030-0100 T-S Radio Budapest, Hungary 6110 9520 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575				5985	9505	15440	
0030-0045 BBC English by Radio, London, Eng 6195 17875 0030-0055 BRT, Brussels, Belgium 9925 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quito, Ecuador (alt. prog.) 15230 0030-0100 T-S Radio Budapest, Hungary 6110 9520 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N, American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea		0004-0015 S		5020	9540	11695	11850
0030-0055 BRT, Brussels, Belgium 9925 0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 0030-0100 T-S Radio Budapest, Hungary 6110 9520 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quilto, Ecuador 9745 11775 15155 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea				6195	7145	11945	15280
0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 6110 9520 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 176690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 0035-0100 HCJB, Quilto, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 15575							
0030-0100 BBC World Service, London, England 5965 5975 6005 6175 7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 15230 6110 9520 9835 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 176690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 0035-0100 HCJB, Quilto, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 15575		0030-0055	BRT, Brussels, Belgium	9925			
7325 9580 9590 9915 11750 11955 15260 15360 0030-0100 HCJB, Quito, Ecuador (alt. prog.) 0030-0100 T-S Radio Budapest, Hungary 11910 15160 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'I, Hilversum 0030-0100 Radio for Peace Int'I, Costa Rica 0000-0100 Radio for Peace Int'I, Costa Rica 0035-0100 HCJB, Quito, Ecuador 0045-0100 Radio Berlin Int'I, East Germany 0045-0100 Radio Korea, Seoul, South Korea 15575		0030-0100		d 5965	5975	6005	6175
0030-0100 HCJB, Quilto, Ecuador (alt. prog.) 0030-0100 T-S Radio Budapest, Hungary 0030-0100 Radio Kiev, Ukrainia 0030-0100 Radio Moscow N. American Service 0030-0100 Radio Moscow N. American Service 0030-0100 Radio Netherlands Int'l, Hilversum 0030-0100 Radio for Peace Int'l, Costa Rica 0035-0100 Radio Berlin Int'l, East Germany 0045-0100 Radio Berlin Int'l, East Germany 0045-0100 Radio Korea, Seoul, South Korea 15230 6110 9520 9835 11910 15100 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 6020 6165 15315 7375 (+13660 21566 T-A) 9745 11775 15155		1800/1800/1800/1800	ometro sociale administrati mentionias Anti∎ioni				
0030-0100 T-S Radio Budapest, Hungary 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 176690 0030-0100 Radio Moscow N. American Service Radio Moscow N. American Service 0030-0100 Radio Netherlands Int'l, Hilversum 0030-0100 Radio for Peace Int'l, Costa Rica 0035-0100 Radio Berlin Int'l, East Germany 0045-0100 Radio Service 0045-0100 Radio Korea, Seoul, South Korea 6110 9520 9835 11910 15160 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 6020 6165 15315 7375 (+13660 21566 T-A) 9745 11775 15155				11750	11955	15260	15360
0030-0100 T-S Radio Budapest, Hungary 0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 0000-0100 Radio for Peace Int'l, Costa Rica 0035-0100 HCJB, Quilto, Ecuador 0045-0100 Radio Berlin Int'l, East Germany 0045-0100 Radio Korea, Seoul, South Korea 6110 9520 9835 11910 15160 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 6020 6165 15315 7375 (+13660 21566 T-A) 9745 11775 15155		0030-0100	HCJB, Quito, Ecuador (alt. prog.)	15230			
0030-0100 Radio Kiev, Ukrainia 7400 9765 15180 17665 17690 0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'I, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'I, Costa Rica 0035-0100 HCJB, Quilto, Ecuador 9745 11775 15155 00045-0100 Radio Korea, Seoul, South Korea 15575		0030-0100 T-S		6110	9520	9835	
0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 9745 11775 15155 6080 11890 13690 0045-0100 Radio Berlin Int'l, East Germany 0045-0100 Radio Korea, Seoul, South Korea 15575				11910	15160		
0030-0100 Radio Moscow N. American Service 6000 6045 7115 7150 7310 9685 9720 12050 15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quilto, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 15575		0030-0100	Radio Kiev, Ukrainia	7400	9765	15180	
7310 9685 9720 12050 15425 17605 17700 17720 21470 21470 6000-0100 Radio Netherlands Int'I, Hilversum 0000-0100 Radio for Peace Int'I, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575		Sandara and American	The state of the s	17665	17690		
15425 17605 17700 17720 21470 0030-0100 Radio Netherlands Int'I, Hilversum 0000-0100 Radio for Peace Int'I, Costa Rica 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575		0030-0100	Radio Moscow N. American Service	6000	6045	7115	7150
0030-0100 Radio Netherlands Int'I, Hilversum 0000-0100 Radio for Peace Int'I, Costa Rica 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575				7310	9685	9720	12050
0030-0100 Radio Netherlands Int'I, Hilversum 0000-0100 Radio for Peace Int'I, Costa Rica 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575				15425	17605	17700	17720
0030-0100 Radio Netherlands Int'l, Hilversum 6020 6165 15315 0000-0100 Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575							
0000-0100 Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A) 0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575		0030-0100	Radio Netherlands Int'l, Hilversum			15315	
0035-0100 HCJB, Quito, Ecuador 9745 11775 15155 0045-0100 Radio Berlin Int'i, East Germany 0045-0100 Radio Korea, Seoul, South Korea 15575							66 T-A)
0045-0100 Radio Berlin Int'l, East Germany 6080 11890 13690 0045-0100 Radio Korea, Seoul, South Korea 15575							
0045-0100 Radio Korea, Seoul, South Korea 15575							
						A 1500 CO.	
						11780	
	_						

0000 UTC [7:00 PM EST/4:00 PM PST]

0000-0025		Radio Finland, Helsinki	9645 15165	11755		
0000-0030	IVI	Radio Norway International, Oslo		E075	6005	6175
0000-0030		BBC World Service, London, England	6195	5975 7145	7325	9580
			9590	157/12/72/	11750	
					15360	
			17830	15260	15360	1/0/5
0000 0000		Kel level leveler	9930	0425	11605	
0000-0030		Kol Israel, Jerusalem	6000		7115	7150
0000-0030		Radio Moscow N. American Service				
			9685		12050	
0000 0050		Bodio Bussiana Node Kons			17720	214/0
0000-0050		Radio Pyongyang, North Korea		15160	44745	
0000-0055		Radio Beijing, China		9770	11/15	
0000-0100		Adventist World Radio, Costa Rica		11870		
0000-0100		Adventist World Radio-Asia, Guam		15225		
0000-0100		All India Radio, New Delhi		7215	9535	9910
				11745	15110	
0000-0100		CBC Northern Quebec Service, Can		(ML)		
0000-0100		CBN, St. John's, Newfoundland, Car				
0000-0100		CBU, Vancouver, British Columbia	6160			
0000-0100		CFCF, Montreal, Quebec, Canada	6005			
0000-0100		CFCN, Calgary, Alberta, Canada	6030			
0000-0100		CHNS, Halifax, Nova Scotia, Canada				
0000-0100		Christian Science World Svc, Boston		9850	13760	
0000-0100		CKWX, Vancouver, British Columbia	6080			
0000-0100		CFRB, Toronto, Ontario, Canada	6070			
0000-0100		FEBC Radio Int'l, Philippines	15480			
0000-0100		KUSW, Salt Lake City, Utah	15580			
0000-0100	T-A	KVOH, Rancho Simi, California	17775			
0000-0100		Radio Australia, Melbourne	15160	15240	15320	17750

LEGEND

- * The first four digits of an entry are the broadcast start time in UTC. The second four digits represent the end time.
- In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

The last entry on a line is the frequency. Several codes may be found after a frequency as follows:

- * SSB indicates Single Sideband transmission.
- * v after a frequency indicates that it varies
- Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
- * [ML] after a frequency indicates a multi-lingual transmission containing English-language programs. All other frequencies may be assumed to be English language programs directed to various parts of the world.
- Listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

HOW TO USE THE PROPAGATION CHARTS

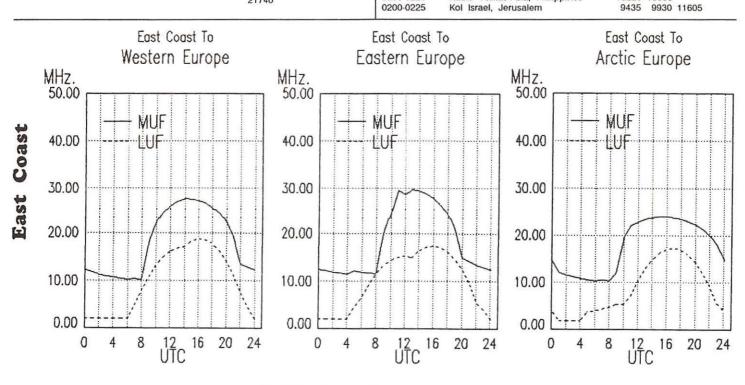
Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location (they are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Useable Frequency [MUF] and the lower line the Lowest Useable Frequency [LUF] as indicated on the vertical axis of the graph.

While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good luck!

C [8:00 PM EST/5:00 PM PST]			
All India Radio, New Delhi 605	5 7215	9535	9910
		15110	
7 4 4 7 10 11 1 1			
The following of the control of the			
The state of the s	0 6165	15315	
CBC Northern Quebec Service, Can 962	5 (ML)		
HCJB, Quito, Ecuador (alt. prog.) 1523)		
Radio Berlin Int'I, East Germany 608	0 11890	13690	
	0 9755		
Radio Moscow N. American Service 600		1 1000000000000000000000000000000000000	
			12050
154:	25 17605	17700	17720
	-		
BBC World Service, London, England 596	55 5975	6005	6175
99	5 11750	11955	15260
153	60 21715		
riadio ragonaria, prigitar		11735	
riddio Frague, orderioonerman		TO THE PARTY.	11680
7.177			
		13760	
	2000		
	20E/1		
	The second second	15155	
	7.77		
The second of th			
1.53	95 17715	17750	17705
	All India Radio, New Delhi All India Radio, New Delhi 1171 RAI, Rome, Italy Kol Israel, Jerusalem Radio Netherlands Int'l, Hilversum CBC Northern Quebec Service, Can HCJB, Quilto, Ecuador (alt. prog.) Lao National Radio, Vientiane Radio Berlin Int'l, East Germany Radio Canada International, Montreal Radio Moscow N. American Service Radio Moscow N. American Service Radio Sweden, Stockholm Radio Sweden, Stockholm Radio Sweden, Stockholm Radio Yugoslavia, Belgrade Deutsche Welle, Koln, West Germany Radio Prague, Czechoslovakia MF BBC (For China, Mongolia, Japan) CBN, St. John's, Newfoundland, Can CBU, Vancouver, British Columbia CFCF, Montreal, Quebec, Canada CFCN, Calgary, Alberta, Canada CFCN, Calgary, Alberta, Canada CHNS, Halifax, Nova Scolia, Canada CHNS, Halifax, Nova Scolia, Canada CFCWX, Vancouver, British Columbia CFRB, Toronto, Ontario, Canada FEBC Radio Int'l, Philippines HCJB, Quito, Ecuador KUSW, Salt Lake City, Utah T-A KVOH, Rancho Simi, California T-A RAE, Buenos Alres, Argentina Radio Australia, Melbourne 15236 1174 1775 1776 1776 1777 1777 1777 1777 1777	All India Radio, New Delhi All India Radio, New Delhi 11715 11715 11715 11715 11715 11715 11715 11715 11715 11715 11715 117175 11715 11800 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6020 6165 6080 611890 6080 6145 7310 9685 15425 17605 21470 Radio Sweden, Stockholm 6040 6045 7310 6085 6095 6005 6045 7310 9685 15425 17605 21470 Radio Sweden, Stockholm 6040 6045 7310 605 6065 607 7225 9915 11750 15360 21715 6005 6005 6005 6006 6045 7310 9685 15425 17605 21470 7225 9915 11750 15360 21715 6005 6005 6005 6005 6006 6006 6006 60	All India Radio, New Delhi All India Radio, New Delhi BAI, Rome, Italy Kol Israel, Jerusalem Radio Netherlands Int'I, Hilversum CBC Northern Quebec Service, Can HCJB, Quilto, Ecuador (all. prog.) Lao National Radio, Vienliane Radio Berlin Int'I, East Germany Radio Canada International, Montreal Radio Moscow N. American Service Radio Sweden, Stockholm BBC World Service, London, England BBC Welle, Koln, West Germany CBN, St. John's, Newfoundland, Can CBU, Vancouver, British Columbia CFCF, Montreal, Quebec, Canada CFCN, Calgary, Alberta, Canada CFCN, Calgary, Alberta, Canada CFCN, Calgary, Alberta, Canada CFRB, Toronto, Ontario, Canada CFRB, Toronto, Ontario, Canada CFCR, Wolth, Rancho Simi, California T-A RAE, Buenos Aires, Argentlina Radio Australia, Melbourne 9930 9435 11715 11715 115230 7113v 6080 11890 11865 5975 6006 6045 7115 7325 9580 9915 11750 11950 11750 11950 11750 11950 11750 11950 11751 11950 11751 11950 11751 11955 11950 11751 11955 11950 11751 11955 11950 11751 11955 11750 11955 11750 11950 11750 11951 11750 11955 11750 11950 11750 11950 11750 11950 11750 11750 1195

0100-0200 S,	M Radio Canada International, Montreal 5960 9535 9755 11845
	11940
0100-0200	Radio Havana Cuba 11820
0100-0200	Radio Japan, Tokyo 17755 17810 17845
0100-0200	Radio Luxembourg, Junglinster 6090
0100-0200	Radio Moscow World Service, USSR 7135 9790 9815 11800
	15140 15170 15295 15420
	17570 17610 17655 17675
	17775 17825 17890 21635
	21690 21790
0100-0200	Radio New Zealand 15485 17705
0100-0200	Radio for Peace Int'l, Costa Rica 7375 (+13660 21566 T-A)
0100-0200	Radio Tonga, Kingom of Tonga 5030v
0100-0200	Spanish National Radio, Madrid 9630 11880
0100-0200	Voice of America-Americas Service 5995 9775 9815 11580
0.00 0200	11740 15205
0100-0200	Voice of America-Caribbean Service 6130 9455
0100-0200	Voice of America-East Asia Service 7115 7205 9740 11705
0.00 0200	15250 21525
0100-0200	Voice of Indonesia, Jakarta 11755 11788
0100-0200	WHRI, Noblesville, Indiana 7315 9495
0100-0200	WINB, Red Lion, Pennsylvania 15145
0100-0200	WRNO Worldwide, Louisiana 7355
0100-0200	WWCR, Nashville, Tennessee 15690
0100-0200	WYFR, Okeechobee, Florida 5985 9505 9680 15440
	1-A Voice of Greece, Athens 7430 9395 9420
0130-0200	Radio Austria International, Vienna 9870 9875 13730
0130-0200	Radio Moscow N. American Service 6000 6045 7115 7150
0.00 0200	7310 9685 9700 9720
	12050 15425 17605 1770
	17720 21470
0130-0200	Radio Veritas-Asia, Philippines 15220 15360
0145-0200	BBC Alternative Programming, London 5965 9580 11955 15380
0145-0200	BBC World Service, London, England 5975 6005 6175 7135
0140 0200	7325 9590 9915 11750
	15260 15360 21715
0155-0200	Vatican Radio, Valican City 7125 9645 11750
0133-0200	validar riadio, validar dily 7123 3043 11730
0200 UT	C [9:00 PM EST/6:00 PM PST]
	- [5.55 : =5./5.55 : : 5.]
0200-0215	Vatican Radio, Vatican City 7125 9645 11750
0200-0210	Radio Veritas-Asia, Philippines 15220 15360
0200 0220	riadio remacraia, rimppines 10220 10000



0200-0230	BBC Alternative Programming, London 9580	11955	15380	
0200-0230	BBC World Service, London, England 5975	6005	6050	6110
	6175	7135	7325	9590
	9915	11750	12095	15260
	15360	15390	21715	
0200-0230	M-F FEBC Radio Int'I, Philippines 15480			
0200-0230	S Radio Budapest, Hungary 6110	9520	9835	
	11910	15160		
0200-0230	Swiss Radio International, Berne 6095	6135	9725	9885
	12035	17730		
0200-0245	Radio Berlin Int'l, East Germany 6080	11890	13690	
0200-0250	Deutsche Welle, Koln, West Germany 6035	7285	9615	9690
		11945		
0200-0250	Radio Bras, Brasilia, Brasil 11745			
0200-0300	Adventist World Radio-Asia, Guam 13720			
0200-0300	CBC Northern Quebec Service, Can 9625	(ML)		
0200-0300	CBN, St. John's, Newfoundland, Can 6160			
0200-0300	CBU, Vancouver, British Columbia 6160			
0200-0300	CFCF, Montreal, Quebec, Canada 6005			
0200-0300	CFCN, Calgary, Alberta, Canada 6030			
0200-0300	CHNS, Halifax, Nova Scotla, Canada 6130			
0200-0300	Christian Science World Svc. Boston 9455	9850	13760	
0200-0300	CKWX, Vancouver, British Columbia 6080			
0200-0300	CFRB, Toronto, Ontario, Canada 6070			
0200-0300		11775	15155	
0200-0300	KUSW, Salt Lake City, Utah 15580			
0200-0300		15240	17715	17750
	The state of the s	21740		
	15320			
0200-0300	Radio Bucharest, Romania 5990	9510	9570	11830
	11940			
0200-0300	Radio Cairo, Egypt 9475	9675		
0200-0300	M-F Radio Canada International, Montreal 9535		11845	11940
0200-0300		11820		
0200-0300	Radio Luxembourg, Junglinster 6090			
0200-0300	Radio Moscow N. American Service 6000	6045	7115	7150
	7310	9685	9700	
	12050	15425		
0200-0300	Radio Moscow World Service, USSR 7135		9780	
	The state of the s	15170		19 EST / TANKS THE
		17590		- 235000000000000000000000000000000000000
	31313	17775	9,0,17,0,7	
		21690		.,000
0200-0300	Radio RSA, Johannesburg, S. Africa 9580		11935	15120
0200-0300	Radio Tonga, Kingdom of Tonga 5030v		. 1000	.0120
	rengaj ningaeni et renga booot			

COMPUTERIZE YOUR SHACK

Control up to eight digital radios simultaneously from your MS-DOS microcomputer! We offer a series of software/hardware packages that interface with most current synthesized rigs.

ICOM: IC-781, 765, 761, 751A, 735, 725, R71A, R7000, 271, 371, 471, 1271, 275, 375, 475, 575, CI-V

KENWOOD: TS-940, 440, 140, R-5000, 680, 711, 811 YAESU: FT-767, 757 GXII, 757 GX, 747, 9600, 736

JRC: NRD 525 COLLINS: 651 S1

Datacom couldn't be simpler. Knowledge of MS-DOS is not necessary -the installation program does it all! Datacom allows complete control of your rig from the keyboard.

A few of its many features:

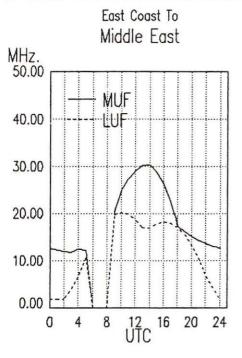
- · Adds scan function to radios that don't allow this from front panel.
- · Adds frequency and associated info memory limited only by disk storage.
- Tabular screen display of all the channels stored in memory, along with a full description of each including: mode (LSB, USB, FM, etc.), eight character alphanumeric description, signal bandwidth.
- Full featured logging utility.
- · Able to automatically log hits while sweeping.
- · Color coded program for ease of use (will run on a monochrome
- . Menus for amateur, AM-FM broadcast, television broadcast, S/W, aviation, marine, with most popular frequencies stored.

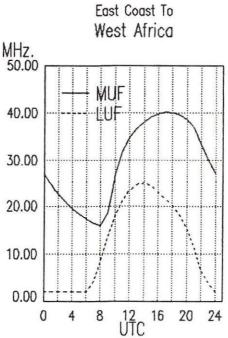
Call or Write today for more information

AVAILABLE FOR IBM PC, XT, AT, 80386 256K RAM 1 SERIAL PORT AND 1 FLOPPY MINIMUM

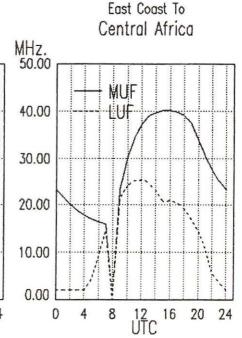
PROGRAM WITH INITIAL LIBRARIES 99.95 RS-232 TO TTL INTERFACE ONLY (NEEDED IF DON'T HAVE MANUFACTURERS INTERFACE) EXTERNAL INTERFACE ALLOWS 4 RADIOS (NOW WITH SQUELCH DETECT CIRCUITRY) INTERNAL PC INTERFACE W/1 SERIAL & 1 RADIO PORT. 129.95 SPECTRUM ANALYZER MODULE COMPLETE SYSTEMS INCL. RADIO, INTERFACE, COMPUTER,

.....(CALL FOR PRICE) DATACOM, INT. 8081 W. 21ST LANE • HIALEAH, FL 33016





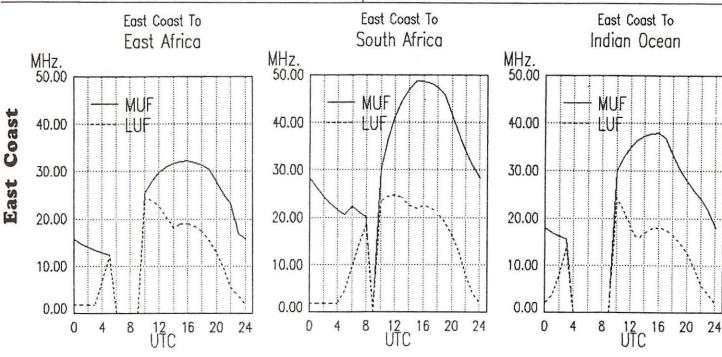
MONITORING TIMES



East

Coast

0200-0300	RAE, Buenos Aires, Argentina 9690	11710			l 0300-0357	Radio Prague, Czechoslovakia	5930	7345	9540	11680
0200-0300	Voice of America-South Asia Service 7115		9740	11705	0000 0007	radio rragae, ozeonosiovana	11990		3340	11000
0200 0000		21525	0,10	11100	0300-0400	CBC, Northern Quebec Service, Ca				
0211-0230 IBB	Voice of the Democratic Alliance of Burma	LIULU			0300-0400	CBN, St. John's, Newfoundland, Ca		()		
OLIT OLOG IIII	(clandestine: Thai/Burmese border) 7137	,			0300-0400	CBU, Vancouver, British Columbia	6160			
0200-0300	Voice of Free China, Taiwan 5950		9680	11740	0300-0400	CFCF, Montreal, Quebec, Canada	6005			
0200 0000		15345	0000	117.10	0300-0400	CFCN, Calgary, Alberta, Canada	6030			
0200-0300	THE PARTY OF THE P	9495			0300-0400	CHNS, Halifax, Nova Scotia, Canad				
0200-0300	WRNO Worldwide, Louisiana 7355	0400			0300-0400	Christian Science World Svc, Bosto		9850	13760	
0200-0300	WWCR, Nashville, Tennessee 7520				0300-0400	CKWX, Vancouver, British Columbia		3030	10700	
0200-0300	WINB, Red Lion, Pennsylvania 15145				0300-0400	CFRB, Toronto, Ontario, Canada	6070			
0200-0300	WYFR, Okeechobee, Florida 5985	0505	15440		0300-0400	Faro del Caribe, San Jose, Costa Rio				
0215-0225	Radio Nepal, Kalmandu 5005		(alt. 32	2201	0300-0400	HCJB, Quito, Ecuador		15155		
	Hadio Budapest, Hungary 6110			9835	0300-0400	KUSW, Salt Lake City, Utah	9815	15155		
0230-0243 W,I		15160	9303	9000	0300-0400	Radio 5, Johannesburg, South Afric				
0230-0300	BBC World Service, London, England 5975	6005	6050	6175	0300-0400	Radio Australia, Melbourne		15395	15010	15000
0230-0300	7135	7325		11750	0300-0400	nadio Australia, Melbourne		17750		
				15360			21525	17750	17795	21740
	21715	12095	15260	15300	0300-0400	Padio Cultural Customala				
0000 0000 T A	THE RESERVE OF THE PROPERTY OF	0000	0705	11010	0300-0400	Radio Cultural, Guatemala	3300	11000		
	Radio Portugal, Lisbon 9600		9705	11840		Radio Havana Cuba		11820	47040	
0230-0300		11705			0300-0400	Radio Japan, Tokyo		11870		7450
0230-0300	Radio Tirana, Albania 9760	44705	*****	15105	0300-0400	Radio Moscow N. American Service		6045		
0245-0300	- HIGHER TOTAL (TO TO THE THE SECOND OF THE TOTAL CONTRACTOR OF THE SECOND OF THE SECO	11785	11890	15125				9685		12010
0245-0300	Voice of Eelam (clandestine: Tamil rebels				0000 0400	Dadie Massau Ward Conder 1100		15425		
	in Sri Lanka)7000				0300-0400	Radio Moscow World Service, USS				
								11995		
0200 LITO	110.00 DM ECT/7.00 DM DCT1	100	-					15295		
0300 UTC	[10:00 PM EST/7:00 PM PST]							17610		
2000 0045	BBO Facility by Badia Landau 41700	44740	45400					17825	1000	
0300-0315		11740			0000 0400	Badla Nam Zastand Walliantan		21690	21790	
0300-0315	BBC World Service, London, England 3255		6005		0300-0400	Radio New Zealand, Wellington	17680			
	6175		6195		0300-0400	Radio Oranje, South Africa	3215			
	7325				0300-0400	RAE, Buenos Aires, Argentina		9690		
		11750			0300-0400	Trans World Radio, Bonaire		11930		
				15260	0300-0400	Voice of America-Africa Service	6035	7280	9525	9575
				21715			11835			
0300-0330		11785	11890	15125	0300-0400	Voice of Free China, Taiwan	5950		9680	9765
0300-0330		9675			The section of the se			15345		
	Radio Canada International, Montreal 9645				0300-0400	WHRI, Noblesville, Indiana	7315	9495		
0300-0330		17825	15325		0300-0400	WRNO Worldwide, Louisiana	7355			
0300-0330										
	Radio Kiev, Ukrainia 7400		17690	15180	0300-0400	WWCR, Nashville, Tennessee	7520			
0300-0330 0300-0330	Radio Kiev, Ukrainia 7400 17665	9765	17690	15180	0300-0400	WYFR, Okeechobee, Florida	6065	9505	15566	
0300-0330 0300-0330 0315-0330	Radio Kiev, Ukrainia 7400 17665 Radio for Peace Int'l, Costa Rica 7375	9765 USB						9505	15566	
0300-0330 0300-0330	Radio Kiev, Ukrainia 7400 17665	9765 USB	17690 9545		0300-0400	WYFR, Okeechobee, Florida	6065 11725	9505 9725		



Swiss Radio International, Berne

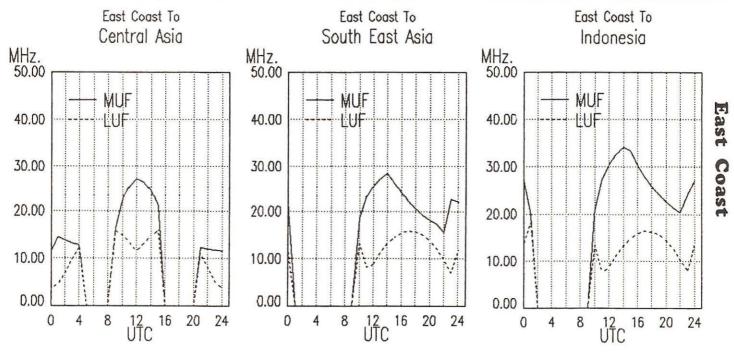
6135 9725 9885 12035

0400-0430

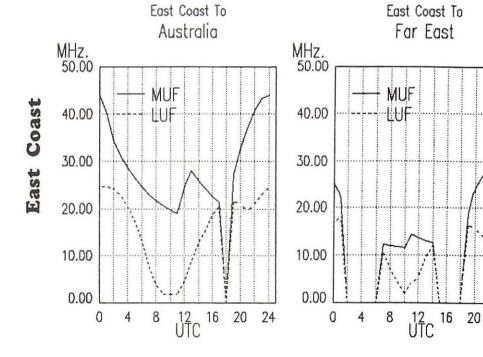
0315-0330	BBC World Service, London, England 325	5975	6005	6050
	6179	6190	6195	7135
	732	9410	9600	9670
	991	11750	11760	11845
	1195	12095	15220	15260
	1531	17705		
0315-0345	Radio France International, Paris 3969	6045	7135	7175
	728	9550	9745	9790
	980	11705	11995	
0330-0400	BBC Alternative Programming, London 3255	6005	6190	9600
	1173	11845	15420	
0330-0400	BBC World Service, London, England 5975	6175	6195	9410
	9670	9915	11760	11955
	1209	15310		
0330-0400	Radio Berlin Int'l, East Germany 9730	13610	15240	
0330-0400 A,S	Radio Canada International, Montreal 964	;		
0330-0400	Radio Netherlands Int'l, Hilversum 959	11720		
0330-0400	Radio Tirana, Albania 976)		
0330-0400	United Arab Emirate Radio, Dubai 1194	15400	15435	17890
0330-0340	All India Radio, New Delhi 390	4860	9610	11830
	1187	11890	15305	
0340-0350 M-A	A Voice of Greece, Athens 743	9395	9420	
0350-0400	RAI, Rome, Italy 1190	15330	17795	
0349-0357v	Radio Yerevan, Armenia 740	9765	15180	
	1769	17665		

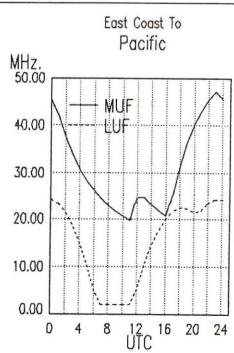
0400-0430 Trans World Radio, Bonalre 0400-0430 Voice of America-Africa Service 0400-0445 Radio Berlin Int'l, East Germany 0400-0450 Deutsche Welle, Koln, West Germany 0400-0450 Radio Pyongyang, North Korea 0400-0455 Radio Beijing, China 0400-0500 CBC, Northern Quebec Service	6035 11835 11785 7 7225 11765 13650 11695	15125 7150	9525 9765	9575 9565
0400-0445 Radio Berlin Int'l, East Germany 0400-0450 Deutsche Welle, Koln, West Germany 0400-0450 Radio Pyongyang, North Korea 0400-0455 Radio Beijing, China	11835 11785 7225 11765 13650 11695	15125 7150 13790		
0400-0450 Deutsche Welle, Koln, West Germany 0400-0450 Radio Pyongyang, North Korea 0400-0455 Radio Beijing, China	11785 / 7225 11765 13650 11695	7150 13790	9765	9565
0400-0450 Deutsche Welle, Koln, West Germany 0400-0450 Radio Pyongyang, North Korea 0400-0455 Radio Beijing, China	7225 11765 13650 11695	7150 13790	9765	9565
0400-0450 Radio Pyongyang, North Korea 0400-0455 Radio Beijing, China	11765 13650 11695	13790	9765	9565
0400-0455 Radio Beijing, China	13650 11695			
0400-0455 Radio Beijing, China	11695	15180		
	THE PARTY OF THE P		17765	
	0625			
	3023	(ML)		
0400-0500 Radio for Peace Int., Costa Rica	7375			
0400-0500 CBN, St. John's, Newfoundland, Car	6160			
0400-0500 CBU, Vancouver, British Columbia	6160			
0400-0500 CFCF, Montreal, Quebec, Canada	6005			
0400-0500 CFCN, Calgary, Alberta, Canada	6030			
0400-0500 CHNS, Halifax, Nova Scotia, Canada				
0400-0500 Christian Science World Svc, Boston		9840	13760	17780
0400-0500 CKWX, Vancouver, British Columbia		of the same		
0400-0500 CFRB, Toronto, Ontario, Canada	6070			
0400-0500 HCJB, Quito, Ecuador	11775	15155		
0400-0500 KUSW, Salt Lake City, Utah	9815			
0400-0500 Radio 5, Johannesburg, South Africa				
0400-0500 Radio Australia, Melbourne		21740	15395	15240
			17795	
0400-0500 Radio Beijing, China			15195	
0400-0500 Radio Havana Cuba			11760	
0400-0500 Radio Moscow World Service, USSR				
	7150			
	200		11955	
			15280	
			15480	
			17610	
			17775	
			21680	
	21790			
0400-0500 Radio New Zealand, Wellington	17680			
0400-0500 Radio Oranje, South Africa	3215			
0400-0500 Radio Sofia, Bulgaria		15310	11720	11765
The state of the s	11735			. 1,05
0400-0500 M-AWMLK Bethel, Pennsylvania	9465			
0400-0500 Radio Tonga, Kingdom of Tonga	5030	1		
0400-0500 Voice of America-Middle East Service			6040	6140
Tolor of Patiental Initial Edgi Delvic	7170		11785	
0400-0500 TP Voice of Hope via KFBS, Guam	15225		11703	13203
0400-0500 Voice of Turkey, Ankara, Turkey		17760		
Torce of Turkey, Arkara, Turkey	3443	17700	l.	

0400 UTC [11:00 PM EST/8:00 PM PST] 0400-0410 M-F Radio Zambia, Lusaka 0400-0410 RAI, Rome, Italy 11905 15330 17795 0400-0415 Radio Berlin Int'l, East Germany 9730 13610 15240 0400-0425 Radio Cultural, Guatemala 3300 0400-0425 Radio Netherlands Int'l, Hilversum 9590 0400-0430 BBC World Service, London, England 3255 3955 5975 6005 6175 6180 6190 6195 7105 9410 9600 9610 9670 9915 11760 11955 12095 15070 15245 15280 15310 15420 17885 21715 0400-0430 Radio Bucharest, Romania 5990 9510 9570 11830 11940 6155 0400-0430 Radio Canada International, Montreal 11790 9895 11790 12050 0400-0430 Radio Moscow N. American Service 9825 15180



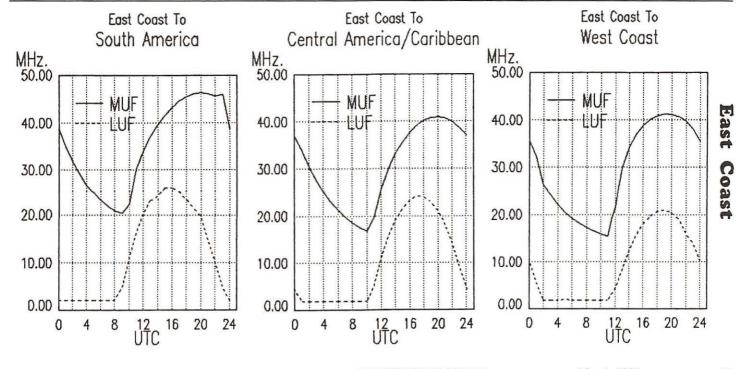
0400-0500 0400-0500	WRNO Worldwide, Louisiana 6185	9495			0500-0600 0500-0600	CHNS, Halifax, Nova Scotia, Canada				
0400-0500	WWCR, Nashville, Tennessee 7520					M-AWMLK Bethel, Pennsylvania	9465			
0400-0500	WYFR, Okeechobee, Florida 6065				0500-0600			9840	13760	17780
0425-0440	RAI, Rome, Italy 5990				0500-0600		6080			
0430-0455		13700			0500-0600		6070			
0430-0500	BBC Alternative Programming, London 6005		9600	11940	0500-0600		6230	9745	11775	
	15400	15420			0500-0600		6175			
0430-0500	BBC World Service, London, England 3955	5975	6180	6195	0500-0600	Radio Australia, Melbourne 2	21525	21740	15240	15395
	9410	9915	12095	15070		1	17715	17750	17795	
	15245	15280	15310	21715			15320			
0430-0500	Radio Moscow N. American Service 7230	9505	9825	9895	0500-0600	Radio Havana Cuba	5965	11760	11820	
	11790	12050	15180		0500-0600	Radio Japan, Tokyo 1	11870	17810	17825	17890
0430-0500	Radio for Peace, Costa Rica 7375	13660			0500-0600	Radio for Peace Int., Costa Rica	7375	USB		
0430-0500		11835			0500-0600		7130	7135	7150	7310
0430-0500	Voice of America-Africa Service 6035	7280	9525	9575				9765		
0445-0500		13690			1	1		11800	72.0	
0455-0500	Voice of Nigeria, Lagos 7255	0.550.55	0.000					15140		
0.00 0000	Total of Ingelia, Eager Tee							15420		
					l			17590		
0500 UTC	[12:00 AM EST/9:00 PM PST]							17635		
0000 010	[12:00 Am 201/0:00 1 m 1 01]							17725		
0500-0505	Radio Oranje, South Africa 3215				1			17890		
0500-0505	Kol Israel, Jerusalem 7460	0/35	11588	11655				21690		21033
0300-0313	17630	3403	11300	11000	0500-0600		17680	21030	21/30	
0500-0515		17730			0500-0600	Radio Tonga, Kingdom of Tonga	5030v			
0500-0513	Radio 5, Johannesburg, South Africa 4880	17730			0500-0600		9630			
0500-0520		13690	15105		0500-0600		3990	6035	7000	9540
0500-0500	Radio Jordan, Amman 13655	13030	13123		0300-0000		9575	0033	1200	9540
0500-0530	Radio Moscow N. American Service 7230	OFOE	11700	17770	0500-0600			FOOF	6040	0000
0300-0330		11770	11790	17770	0300-0000		7170		11785	
0500-0530	Voice of America-Middle East Service 5995	6060	6140	7170	0500-0600			1200	11/85	15205
0300-0330	7200	9670	9700		0500-0600		15225			
		15205	9700	9740		3	7255	0.405		
0500-0545			COOF	0400	0500-0600 0500-0600		7315	9495		
0500-0545	BBC World Service, London, England 3955	5975	6005	6180			6185			
	6190	6195	7120	7230	0500-0600		7520	10.000	6000000	10/2825-01
	9410		9600	9640	0500-0600			11580	13695	15566
		11940			0510-0600		7285			
		15280			0525-0600					
		17885	21470	21715	0530-0545		6050		7210	
	9915				0530-0600		6015	6155	13730	15410
0500-0550	Deutsche Welle, Koln, West Germany 5960		9670	9700	525200000000000000000000000000000000000		21490			
0500-0555	Radio Beijing, China 11840				0530-0600			17720		
0500-0600	CBU, Vancouver, British Columbia 6160				0530-0600	UAE Radio Dubai	15435	17830	21700	
0500-0600	CFCF, Montreal, Quebec, Canada 6005									



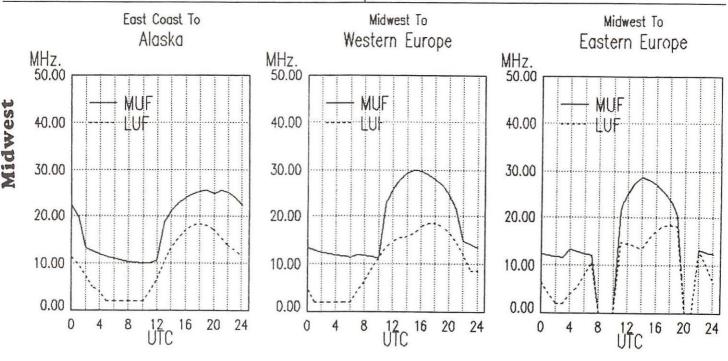


24

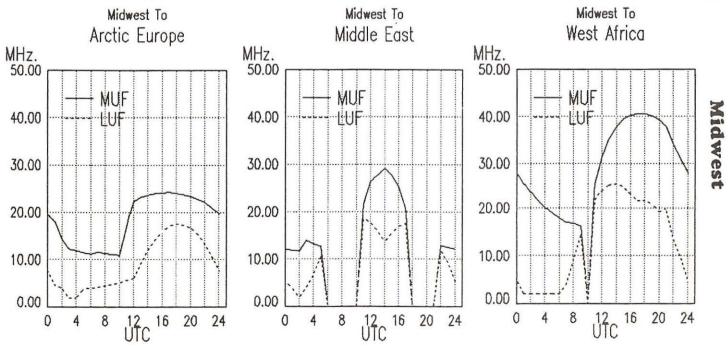
0530-0600	Radio Moscow N. American Service 7175	7185	7230	7270	1 0600-0700	Radio Moscow World Service, USSR 6175 7130 7135 7310
		11790				9450 9515 9765 9795
	15180				1	11765 11775 11800 11880
0545-0600	BBC World Service, London, England 3955	5975	6180	6190	1	11995 11995 12010 12055
	6195			9410		13650 13715 15140 15150
	9580			11760		15170 15280 15295 15320
	11940	12095	15070	15245		15420 15435 15465 15455
	15280	15310	15400	15420		15465 15480 15500 17570
	17885	21470	21715			17590 17600 17610 17625
0555-0600	Voice of Malaysia, Kuala Lumpur 6175	9750	15295			17655 17665 17675 17700
	35					17735 17775 17825 17890
Formation Control		90 W. T.	-		1	21635 21690 21680
0600 UTC	[1:00 AM EST/10:00 PM PST]			A COLST	0600-0700	Radio Tonga, Kingdom of Tonga 5030v
	13 115 11 11 11 11 11 11	114		100	0600-0700	Voice of America-Africa Service 3990 6035 6080 6125
0600-0615	Vatican Radio, Vatican City 6185					7280 9530 9540 9575
0600-0630	BBC World Service, London, England 3955	5975	6180	6190		11915
	6195		7150		0600-0700	Voice of America-Middle East Service 3980 5965 5995 6060
	9410		9600			6095 6140 7170 7200
		11940				7325 9715 11785 11805
		15245				11925 15195
		15400			0600-0700	Voice of Hope, Lebanon 6280
		17740	17790	17885		TP Voice of Hope via KFBS, Guam 15225
		21715			0600-0700	Voice of Malaysia, Kuala Lumpur 6175 9750 15295
0600-0700		13650				S WRNO Worldwide, Louisiana 6185
0600-0650	CBU, Vancouver, British Columbia 6160				0615-0630	M-F Radio Canada International, Montreal 6050 6150 7155 9740
0600-0700	CFCF, Montreal, Quebec, Canada 6005				12/2/02/02/02/02/07	9760 11840
	AWMLK Bethel, Pennsylvania 9465				0615-0630	Vatican Radio, Vatican City 15190 17730
0600-0700	Radio Mediterranean, Malta 9765				0615-0700	Radio Berlin Int'i, East Germany 15240 17880
0600-0700	CFCN, Calgary, Alberta, Canada 6030				0630-0700	Radio Australia, Melbourne 21740 21525 17715 15395
0600-0700	CHNS, Halifax, Nova Scotia, Canada 6130	0050	44000		0000 0700	15240 15160
0600-0700	Christian Science World Svc, Boston 9455	9850	11980		0630-0700	BBC Alternative Programming, London9600 11940 15400 17740
0600-0700	CKWX, Vancouver, British Columbia 6080				0630-0700	BBC World Service, London, England 3955 5975 6180 6190
0600-0700 0600-0630 S	CFRB, Toronto, Ontario, Canada 6070	15165				6195 7120 7150 7230 9410 9580 9640 11760
0600-0630 S	[MAD [THE STATE OF THE STATE O	USB				11955 12095 15070 15245
0600-0645		6115	OGAE	12610		15280 15310 15360 15420
0600-0650	Deutsche Welle, Koln, West Germany11765					17640 17710 17885 17790
0600-0030		9745		17075		21470 21715
0600-0700	KUSW, Salt Lake City, Utah 6175		11/13		0630-0700	Radio Polonia, Warsaw, Poland 6135 7270 15120 9675
0600-0700		21740	15160	15240	0630-0700	Radio New Zealand, Wellington 9860
0000-0000		15395			0630-0700	Swiss Radio International, Berne 12030 15430 17570 21520
0600-0700	Radio Jordan, Amman 13655		17713		0645-0700	BBC English by Radio, London 5875 7260 11945
0600-0700	- INTEREST (AT CONTRACTOR OF THE STATE OF TH	7185	7230	9505	0645-0700	
2300 0100		11790	, 200	0000	0645-0700	GBC Radio, Accra, Ghana 6130
	3023				0645-0700	HCJB, Quito, Ecuador 9610 11835 (alt 6050)
						(all 0000)



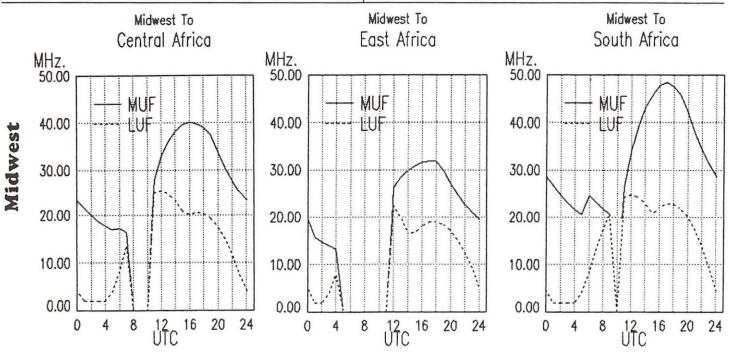
0645-0700	Radio Bucharest, Romania 21550 11940 15335	17720	15320 15420 15465 15435
	17805 15250		15455 15465 15500 15560
0645-0700 M-	F Radio Canada International, Montreal 6050 6150 7155	9740	17570 17590 17600 17610
	9760 11840	- 1	17625 17655 17665 17675
			17700 17735 17765 17775
No. Record - MONDAY			17810 17825 17840 17855
0700 UT	[2:00 AM EST/11:00 PM PST]		17890 21635 21680 21690 21790
0700-0715	Radio Bucharest, Romania 21550 11940 15335	17720	0700-0800 Radio Tonga, Kingdom of Tonga 5030v
5.000 5.1 NS/	17805 15250	(0700-0800 Voice of Free China, Talwan 6130 9745 11925
0700-0730	BBC World Service, London, England 3955 5975 6180	6190	0700-0800 TP Voice of Hope via KFBS, Guam 15225
0,00	6195 7120 7150		0700-0800 Voice of Malaysia, Kuala Lumpur 6175 9750 15295
	7325 9410 9580		0700-0800 S WRNO Worldwide, Louisiana 6185
	9640 11760 11940	55.00	0710-0800 HCJB, Quito, Ecuador (S. Pacific Sv.) 6130 9745 11925
	12095 15070 15245		0715-0730 BBC English by Radio, London 11860 15105
	15310 15360 15420	ACCESSOR 1000	0715-0730 Vatican Radio, Vatican City 15190 17730
	17710 17740 17885		0715-0800 S FEBA, Mahe, Seychelles 15275 17820
	21470 21660 21715		0730-0745 BBC English by Radio, London 3975 6010 7210 9825
0700-0800 A	Radio for Peace Int'l. Costa Rica 7375 USB		0730-0800 ABC, Alice Springs, Australia 2310 (ML)
0700-0750	Radio Pyongyang, North Korea 15340 11335		0730-0800 ABC, Katherine, Australia 2485
0700-0800	Voice of Hope, Lebanon 6280		0730-0800 ABC, Tennant Creek, Australia 2325 (ML)
0700-0800	Radio New Zealand 9860		0730-0800 Radio Australia, Melbourne 21525 17715 15395 15160
0700-0800	CBU, Vancouver, British Columbia 6160	1,	9655
0700-0800	CFCF, Montreal, Quebec, Canada 6005	17	0730-0800 Radio Sofia, Bulgaria 11720 15160 17820
0700-0800	CFCN, Calgary, Alberta, Canada 6030		0730-0800 BBC Alternative Prgramming, London 9600 11860 15105
0700-0800	CHNS, Halifax, Nova Scotia, Canada 6130		0730-0800 BBC World Service, London, England 5975 6190 7150 7325
0700-0800	Christian Science World Svc, Boston 9455 9840 11980	1,	9410 9640 11760 11940
0700-0800	CKWX, Vancouver, British Columbia 6080		
0700-0800	CFRB, Toronto, Ontario, Canada 6070	1	11955 12095 15070 15280
0700-0800	GBC Radio, Accra, Ghana 6130	1	15310 15360 15420 17640
0700-0800		050)	17710 17740 17790 21660
0700-0800	HCJB, Quito, Ecuador 9610 11835 (alt. 6) KNLS, Anchor Point, Alaska 9785		21715
			0730-0800 M-F BBC World Service, London, England 6180 17885 21470 15245
0700-0800	KUSW, Salt Lake City, Utah 6135		0730-0755 Radio Finland, Helsinki 6120 9560 11755
0700-0730	Radio Australia, Melbourne 21740 9655 21525		0730-0800 Radio Netherlands Int'l, Helsinki 9630 15560
0700 0000	15395 17715 15240		0730-0800 Swiss Radio Int'l European Service 3985 6165 9535
0700-0800	Radio Japan, Tokyo 15325 17765 17810	17890	
0700 0000	21690		0000 UTO 10 00 AM FOT 140 00 AM BOTS
0700-0800	Radio Jordan, Amman 13655		0800 UTC [3:00 AM EST/12:00 AM PST]
0700-0800		9505	
0700 0000	9825		0800-0825 M-F BRT, Brussels, Belgium 6035 11695 21815
0700-0800	Radio Moscow World Service, USSR 7130 7135 7310		0800-0825 Radio Netherlands Int'l, Hilversum 9630 15560
	9515 9795 11705		0800-0825 Voice of Malaysia, Kuala Lumpur 6175 9750 15295
	11765 11800 11995		0800-0830 S Radio Norway International, Oslo 15165
	12055 13715 15140	100 C TO TO THE SEC.	0800-0830 Voice of Islam, Dhaka, Bangladesh 15195 11705
	15170 15260 15280	15295	0800-0900 ABC, Alice Springs, Australia 2310 (ML)



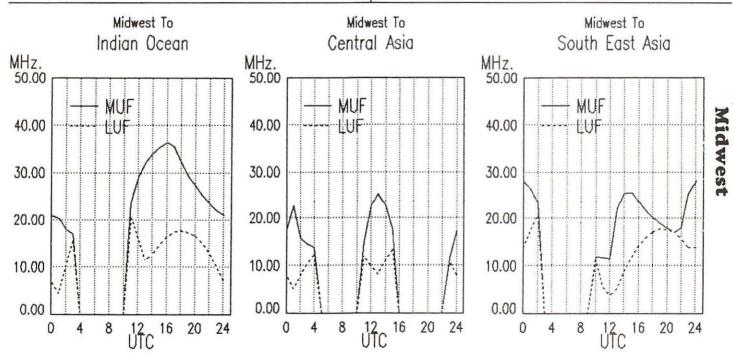
			6050	6065	6100	6140				11760	11940	12095	15070
0830-0840		All India Radio, New Delhi	5960	5990	6010	6020				9740	9750	9760	11750
0000		Tago Tagitana, molecumo		11720			5000 1000		550 Sila Golffico, London, Lingi	6195	7325		9660
0830-0900	0	Radio Australia, Melbourne		17750	17715	15395	0900-1000		BBC World Service, London, Engl		6045	6180	6190
	S	WRNO Worldwide, Louisiana	6185				0900-1000	3	Voive of Hope, Lebanon	6280			
0810-0820		Bayerischer Rundfunk, Munich	6085				0900-1000		Radio Bhutan, Thimpu	5023			
0800-0900		Voice of Nigeria, Lagos	7255	11700			0900-1000		Radio for Peace Int., Costa Rica	7375	LISB		
0800-0900		Voice of Indonesia, Jakarta		11788			0900-1000	S		9670	(MIL)		
0800-0900		Radio Tonga, Kingdom of Tonga	5030				0900-1000		ABC, Tennant Creek, Australia	2325	(ML)		
0800-0900		Radio New Zealand, Wellington	9860				0900-1000		ABC, Katherine, Australia	2485	(MIL)		
			21790		21090	21123	0900-1000		ABC, Alice Springs, Australia	2310	(MI)		
				21680						21680	17020	21000	21050
				17765			0900-0950		Dedisone Welle, Kolii, West Germa		17820		
				17765			0900-0930	0	Deutsche Welle, Koln, West Germa		0650	15/10	11045
				17610			0900-0930	S			13440	17/10	El .
				17570 17610			0900-0930		KTWR, Agana, Guam Radio Beijing, China	15200	15440	17710	
				15455			0900-0925		Radio Netherlands Int'l, Hilversum		21485		
				15295			0900-0925		Radio Finland, Helsinki		21550		
						15260	0900-0925		BRT, Brussels, Belgium	9925	01550		
				11800			0900-0920		ABC, Perth, Australia	15425			
				11625			0000 0000		ARC Bodh Australia		15235	15250	1//0
0800-0900		Radio Moscow World Service, USSI								7250		7295	
0800-0900		Radio Jordan, Amman	13655	7405	7040	0450					7140		
0000 0000		Bodie Lodes Assessed		17750	15160	11930	6			6050	6065		
0800-0830		Radio Australia, Melbourne	9580		21525		0900-0910		All India Radio, New Delhi	5960	5990		100000000000000000000000000000000000000
0800-0900		KUSW, Salt Lake City, Utah	6135			1 2 2 2 2 2 2							
0800-0900		KTWR, Agana, Guam	15200				0900 U	ITC	[4:00 AM EST/1:00 AM	PST			
0800-0900		KNLS, Anchor Point, Alaska	7355				2000 11			DOTI			
0800-0900		HCJB, Quito, Ecuador (S. Pacific S		11925									
0800-0900		HCJB, Quito, Ecuador(alt.S.Pac.Svc.								11850	15235	15250	1770
0800-0900		CFRB, Toronto, Ontario, Canada	6070							7250	7280	7295	9610
0800-0900		CKWX, Vancouver, British Columbia	6080							7110	7140		
0800-0850		Radio Pyongyang, North Korea		15160	11830					6050	6065	6100	6140
0800-0900		Christian Science World Svc, Boston		17855			0850-0900		All India Radio, New Delhi	5960	5990	6010	
0800-0900		CHNS, Halifax, Nova Scotia, Canad					0845-0900		Radio Berlin Int'i, East Germany	6040	6115	7185	9730
0800-0900		CFCN, Calgary, Alberta, Canada	6030				0845-0900		KTWR, Agana, Guam	15210	10000	17070	21000
0800-0900		CFCF, Montreal, Quebec, Canada	6005				0830-0900		Swiss Radio International, Berne		13685	17670	21695
0800-0900		CBU, Vancouver, British Columbia	6160				0830-0900		Radio Netherlands Int'l, Hilversum	17575		17710	
0800-0900		CBN, St. John's, Newfoundland, Ca					0830-0900		Radio Beijing, China		15440		
0800-0900	A	Voice of Hope, Lebanon	6280	USB			0830-0900	IVI-7-	Radio Austria International, Vienna		13730	15450	21/100
	Α	ABC, Tennant Creek, Australia Radio for Peace Int., Costa Rica	7375				0830-0855	Μ-Δ	A Radio Netherlands Int'l, Hilversum	9770	13230	17703	
0800-0900 0800-0900		ABC, Perth, Australia	15425 2325	(NAL)						7280	7295 15250		11850



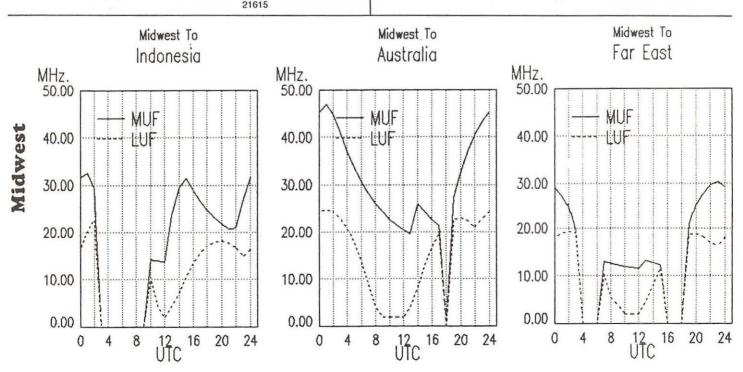
		15245 1528 15400 1542 17790 1788	0 17640 1 5 21470 2	7705	0930-0935	All India Radio, New Delhi	5960 6050 7110	5990 6065 7140	6010 6100 7160	6140 7250
		21710 2171	5				7280	7295		11850
0900-1000	CFCF, Montreal, Quebec, Canada	6005			0000 0055	Bodie Flatend Helefald		15250	1//05	
0900-1000	CFCN, Calgary, Alberta, Canada	6030			0930-0955	Radio Finland, Helsinki	15245	17800		
0900-1000	CHNS, Halifax, Nova Scotia, Canada		-		0930-0955	RRI Surabaya, Jawa Timur, Indon		11055	15000	17000
0900-1000	Christian Science World Svc, Boston		5		0930-1000	BBC English by Radio, London	6160	11955	15280	17830
0900-1000	CKWX, Vancouver, British Columbia				0930-1000	CBN, St. John's, New Foundland	11805			
0900-1000	CFRB, Toronto, Ontario, Canada	6070			0930-1000	KTWR, Agana, Guam		15110	17710	
0900-1000	FEBC Radio Int'I, Philippines	11850			0930-1000	Radio Beijing, China	11//5	15440	1//10	
0900-1000	HCJB, Quito, Ecuador(alt. S.Pac.Sv.)		-							
0900-1000	HCJB, Quito, Ecuador (S. Pac. Sen		5		1000 LITC	15.00 AM ECT/2.00 AM	DCTI			701
0900-1000	KUSW, Salt Lake City, Utah	6135			1000 010	5:00 AM EST/2:00 AM	L211			
0900-0930	Radio Australia, Melbourne	9580 965			1000 1015	KTMD Assess Over	44005			
	5 W 1	15415 1771	5 11930	6020	1000-1015	KTWR, Agana, Guam	11805	0505	0005	11005
0900-1000	Radio Japan, Tokyo	17810			1000-1015 M-	FRadio Budapest, Hungary	6110		9835	11925
0900-1000	Radio Jordan, Amman	13655			1000 1005 11	FROT BUILDING		15220		
0900-1000	Radio Metro, Johannesburg, S. Africa		5 0450	0700		F BRT, Brussels, Belgium		26050		
0900-1000	Radio Moscow World Service, USSF				1000-1030	Radio Afghanistan, Kabul		15350	4940	
		9875 1180				Radio for Peace Int., Costa Rica	7375			
		11705 1176			1000-1030	Voice of Vietnam, Hanoi		15010		
		15150 1526			1000-1030	Radio Beijing, China		15440		
		15320 1534			1000-1030	Swiss Radio International, Berne		13685	1/6/0	21695
		15455 1546			1000-1045	Radio Berlin Int'I, East Germany	11890	/* 41 V		
		15500 1552			1000-1100	ABC, Alice Springs, Australia	2310	(ML)		
		15580 1559			1000-1100	ABC, Katherine, Australia	2485			
		17600 1760			1000-1100	ABC, Perth, Australia	9610	****		
		17645 1765			1000-1100	ABC, Tennant Creek, Australia	2325	(ML)		
		17700 1773			1000-1100	Adventist World Radio-Asia, Guam				
		17810 1784			1000-1100	All India Radio, New Delhi		11915	15050	15335
		21635 2166		21690	1000 1100	550 111 11 5 1 1 1 5		21735		
		21725 2180	00		1000-1100	BBC World Service, London, Eng			6180	
0900-0930	Radio New Zealand, Wellington	9860					6195			9660
	N Radio Tanpa, Nagara, Japan	3925					9740			11750
0900-1000	Radio Tonga, Kingdom of Tonga	5030v						11940	3.5	
0900-1000	Voice of Nigeria, Lagos	7255	_					15310		
0900-1000	WHRI, Noblesville, Indiana	7355 949	15					17640		
	S WRNO Worldwide, Louisiana	6185						21470	21660	21710
0920-1000	ABC, Perth, Australia	6140	Name and the second		1000-1100	CBN, St. John's, Newfoundland, (
0930-1000	Radio Australia, Melbourne	15415 1193		9655	1000-1100	CFCF, Montreal, Quebec, Canada				
	Table 1991 - Park St Park St S	9580 602			1000-1100	CFCN, Calgary, Alberta, Canada	6030			
0930-1000	Radio Afghanistan, Kabul	17720 1535	0 4940		1000-1100	CHNS, Halifax, Nova Scotia, Cana				
0935-0945 IF	RR Al-Quds Radio (Palistinian clandestin				1000-1100	Christian Science World Svc, Bos		9495		
	Syria)	7460 (alt.	4320) ML		1000-1100	CKWX, Vancouver, British Columb	ia 6080			



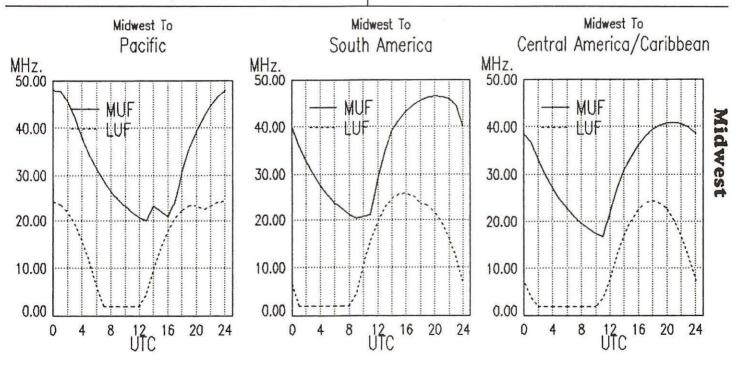
1000-1100 FEBC Radio Int'l, Philippines 11850 1100-1130 Voice of the Democratic Alliance of Burma (clandestine: Thai/Burmese border) 7137v 713								
1000-1100 HGJB, Oulto, Ecuador 9745 11925 1100-1100 1000-1100 MCWR, Agana, Guam 11805 1100-1100 1100-1100 Radio Australia, Melbourne 9840 9855 15415 11930 1100-1100 1000-1100 Radio Moscow World Service, USSR 7130 7000 9780 9875 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11800 12055 11705 11765 11760 11800 12055 11705 11765 11760 11800 12055 11705 11765 11760 11800 11805 1180	1000-1100							
1000-1100 KTWR, Agana, Guam 11805 11806 1000-1100 1000	1000-1100						1100-1130	
1000-1100 Radio Australia, Melbourne 9580 9655 5415 11930 9770 9580 9650 11950 11705 11765 11760 11765 11760 1	1000-1100	HCJB, Quito, Ecuador		11925				
1000-1100 Radio Australia, Melbourne 9580 955 15415 1930 1000-1100 Radio Jordan, Amman 13655	1000-1100	KTWR, Agana, Guam	11805					
1000-1100 Radio Jordan, Amman 1000-1100 Radio Melro, Johannesburg, S. Africa 1805 1170	1000-1100	KUSW, Salt Lake City, Utah	6135				1100-1130	
1000-1100 Radio Jordan, Amman 13655 13	1000-1030	Radio Australia, Melbourne	9580	9655	15415	11930		17590 17685
1000-1100 Radio Metro, Johannesburg, S.Africa 1805 1806			9770	5995	6020		1100-1130	Radio Berlin Int'l, East Germany 6115
Radio Moscow World Service, USSR 7130 7300 9780 9875 1100-1150 1100-1200	1000-1100	Radio Jordan, Amman	13655				1100-1130	Swiss Radio International, Berne 13635 15570 17830 21770
11705 11765 11800 12055 15140 15150 15260 15205 1520 1520 1520 1520 1520 1520 15	1000-1100	Radio Metro, Johannesburg, S. Africa	11805				1100-1150	Radio Pyongyang, North Korea 11735 9977 9645
15140 15150 15200 15405 15435 15405 15435 15405 15435 15405 15435 15450 15405 15435 15405 15435 15405 15435 15405 15435 15405 15435 15405 15435 15405	1000-1100	Radio Moscow World Service, USSI	R 7130	7300	9780	9875	1100-1150	Deutsche Welle, Koln, West Germany15410 17765 17800 21600
15320 15405 1540			11705	11765	11800	12055	1100-1155	Radio Beijing, China 9665
15320 15405 1540			15140	15150	15260	15280	1100-1200	ABC, Alice Springs, Australia 2310 (ML)
15465 15500 15520 15530 1500-1200 1100-1200 15590 17605 1760							1100-1200	
17610 17625 17645 17665 17685 17685 17685 17685 17785 17765 17810 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17825 17850 1785			15465	15500	15520	15530	1100-1200	
17610 17625 17645 17665 17685 17685 17685 17685 17785 17765 17810 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17820 17840 17890 21680 17825 17850 1785			15590	17565	17570	17605	1100-1200	ABC, Perth, Australia 9610
17700 17735 17765 17810 17800 17800 17800 17800 17800 21680 21680 21725 21800 1100-1200 1000-1100 Voice of America-Caribbean Service 5985 11720 15425 1725 1765 17810 1700-1200 1000-1100 Voice of Migeria, Lagos 7255 11720 15425 1560 15220 1000-1200 1000-1100 Voice of Nigeria, Lagos 7255 17645 17800 17800 17800 17800 17800 17800 17705 17800 17800 17800 17705 17800 17800 17800 17705 17800 17800 17800 17705 17800 1								
17820 17840 17890 21660 21725 21800 21660 21725 21800 21800 21725 21800 21725 21800 21800 21725 21800 21800 21800 2180								
1000-1100								
1000-1100								
1000-1100	1000-1100	Voice of America-Caribbean Service			2.000			
1100-1100 Voice of Nigeria, Lagos 7255 6185					15425			
1000-1100 S WRNO Worldwide, Louisiana 6185 6110 9585 9835 11925 1100-1200								
1030-1045 M-F Radlo Budapest, Hungary								
1030-1100 Radio Australia, Melbourne 15160 15220 15415 11930 9770 9580 6020 5995 10030-1100 Adventist World Radio, Forli, Italy 7230 10030-1100 Radio Netherlands Int'l, Hilversum Radio Berlin Int'l, East Germany 1045-1100 S Radio Budapest, Hungary 7220 9585 9835 11910 11925 15160 15220 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 Radio Japan, Tokyo 9875 11765 11765 11765 11920 11925 15160 15220 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 Radio Japan, Tokyo 9780 9875 11765 11765 11765 11765 15460 15220 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-1200 1100-1200 1100-1200 Radio Japan, Tokyo 6120 11815 11840 1100-120				9585	9835	11925		
1030-1100	1000 1040 111	ridate badapoot, ridiigary			0000	,,,,,		
1030-1100 Adventist World Radio, Forli, Italy 7230	1030-1100	Radio Australia Melbourne			9770	9580	1100 1100	
1030-1100 Adventist World Radio, Forli, Italy 7230 6020 9505 1100-1200 Radio Japan, Tokyo 6120 11815 11840 13655 1100-1200 Radio Jordan, Amman 13655 1100-1200 1100-1200 Radio Jordan, Amman 13655 1100-1200 Radio Jordan, Amman 13655 1100-1200 15280 15280 15320 15345 15460 15280	1000 1100	riadio Additalia, Molbodino			0,,0	0000	1100-1200	
1030-1100 Radio Netherlands Int'l, Hilversum Radio Berlin Int'l, East Germany 1045-1000 S Radio Budapest, Hungary 1045-1000 S Radio Budapest, Hungary 1095 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 11925 15160 15220 15345 15460 15460 15460 15460 15520 15520 15520 15520 15520 15520 15520 15520 1565 17645 17605 17645 17605 17645 17605 17645 17605 17645 17605 17605 17645 17605 17605 17645 17605 17605 17645 17605 17	1030-1100	Adventist World Radio Forli Italy		0000				
1045-1100 Radio Berlin Int'l, East Germany (1045-1000 S Radio Budapest, Hungary (1045-1000 S Radio Moscow World Service, USSR (1040) (1050) (1045-1000 S Radio Moscow World Service, USSR (1040) (105				9505				
1045-1000 S Radio Budapest, Hungary 7220 9585 9835 11910 11925 15160 15220 9585 9835 11910 11925 15160 15220 9585 9835 11910 11925 15160 15220 1520 1520 1520 1520 1520 1520 15				5505				
1100 UTC [6:00 AM EST/3:00 AM PST] 1100-1115 Radio Pakistan 21575 17555				9585	9835	11910	1100 1200	
1100 UTC [6:00 AM EST/3:00 AM PST] 1100-1115 Radio Pakistan 21575 17555	1045 1000 0	riadio badapest, rialigary					1	
1100 UTC [6:00 AM EST/3:00 AM PST] 1100-1115 Radlo Pakistan 21575 17555 1100-1115 BBC World Service, London, England 5965 5975 6045 6180 6190 6195 7325 9410 9660 9740 9750 9760 11750 11760 11775 11940 1100-1200 15400 17600 17700 17700 17800 17700 17700 17700 17800 21800 1100-1200 15400 17600 17700 17700 1100-1200 1100-1200 15400 17600 17700 17800 17800 21600 1100-1200			11023	13100	13220		1	
1100 UTC [6:00 AM EST/3:00 AM PST] Radio Pakistan BBC World Service, London, England 5965 5975 6045 6180 6190 6195 7325 9410 9660 9740 9750 9760 11750 11760 11775 11940 15420 17640 17705 17790 15420 17640 17705 17790 17895 21470 21660 15530 15560 17565 17645 17665 17570 17605 17645 17890 21600 21600 21680 21725 21800 Voice of America-Caribbean Service 100-1200 Voice of America-East Asia Service 15155 15425 15155 15425 16185							1	
1100-1115 Radlo Pakistan 21575 17555	1100 LITC	16:00 AM FST/3:00 AM F	ITZ				1	
1100-1115 Radio Pakistan 21575 17555 17500 17700 17735 17810 17840 17890 21680 21725 17890 17890 17890 21680 21725 17890	1100 010	(0.00 AM 201/0.00 AM 1	2.1				1	
1100-1115 BBC World Service, London, England 5965 5975 6045 6180 6195 7325 9410 9660 9740 9750 9760 11775 11790 1170-1200 Radio South Africa, Johannesburg 11805 1100-1200 Voice of America-Caribbean Service 5985 6110 9760 11720 1100-1200 Voice of America-East Asia Service 5985 6110 9760 11720 1100-1200 S WRNO Worldwide, Louisiana 6185	1100-1115	Radio Pakistan	21575	17555			1	
6190 6195 7325 9410 9660 9740 9750 9760 1100-1200 Radio South Africa, Johannesburg 11805 11750 11760 11775 11940 1100-1200 Voice of America-Caribbean Service 5985 6110 9760 11720 15420 17640 17705 17790 17885 21470 21660 1100-1200 S WRNO Worldwide, Louisiana 6185						6180	L	
9660 9740 9750 9760 11750 11760 11775 11940 12095 15070 15140 15310 15420 17640 17705 17790 17885 21470 21660 1960 9740 9750 9760 1100-1200 Radio South Africa, Johannesburg 11805 Voice of America-Caribbean Service 5985 6110 9760 11720 100-1200 S WRNO Worldwide, Louisiana 6185	1100-1115	BBC World Service, Loridon, Engla					1	
11750 11760 11775 11940 1100-1200 Voice of America-Caribbean Service 12095 15070 15140 15310 15420 17640 17705 17790 17885 21470 21660 1100-1200 S WRNO Worldwide, Louisiana 9590 11915 5985 6110 9760 11720 15155 15425							1100-1200	
12095 15070 15140 15310 1100-1200 Voice of America-East Asia Service 5985 6110 9760 11720 15420 17640 17705 17790 1500-1200 S WRNO Worldwide, Louisiana 6185								
15420 17640 17705 17790 15155 15425 17885 21470 21660 1100-1200 S WRNO Worldwide, Louisiana 6185								
17885 21470 21660 1100-1200 S WRNO Worldwide, Louisiana 6185							1100-1200	
							1100 1000	
15265 15360 15400 1115-1145 Radio Nepai, Natinandu (External Svc.) 5005								T
			15285	15360	15400		1115-1145	nadio Nepai, Kalmandu (External Svc.) 5005



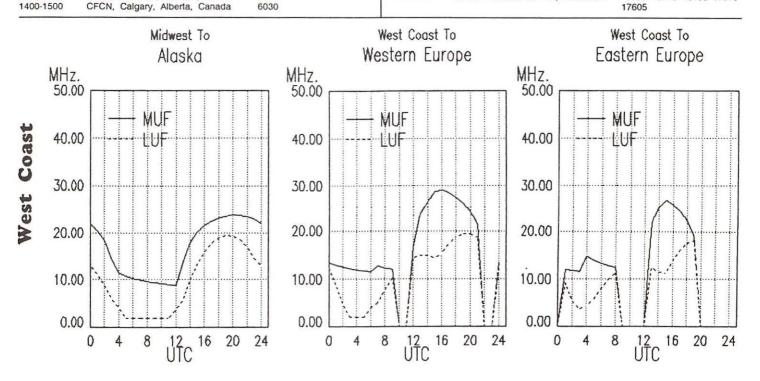
1115-1130	BBC World Service, London, England 596	5 597	6045	6180	1200-1225		Voice of Islamic Republic of Iran	7190	7215	7230	9695
	619	0 619	7325	9410	1200-1230		Radio East Africa,	9585			
	966	0 974	9750	9760	1200-1230	S	Radio Norway International, Oslo	15165			
	1176	0 1177	5 11940	12095	1200-1230		Radio Tashkent, Uzbekistan, SSR	5945	9540	9600	11785
	150	0 1514	0 15285	15310				15470			
	1542	0 1536	0 15400	17640	1200-1245		Radio Berlin Int'I, East Germany	6115	9665	13690	17780
	1770	5 1779	0 17885	21470	1200-1300		ABC, Alice Springs, Australia	2310	(ML)		
	216	0 2171	0 25750		1200-1300		ABC, Brisbane, Australia	9660			
1115-1130	Vatican Radio, Vatican City 178-	0 2148	5		1200-1300		ABC, Katherine, Australia	2485			
1130-1140	Trans World Radio, Bonaire 953	5 1193	0		1200-1300		ABC, Perth, Australia	9610			
1130-1145	BBC English by Radio, London 178	0 2149	0		1200-1300		ABC, Tennant Creek, Australia	2325	(ML)		
1130-1145 A	Radio Budapest, Hungary 1519	0 611	9835		1200-1300		Adventist world Radio, Costa Rica	9725	11870		
	1510	0 1522	0		1200-1300		BBC World Service, London, Englan	d 5965	5975	6045	6190
1130-1145	RRI Yogyakarta, Yogyakarta, Indonesia 504	6						6195		9410	
1130-1200	BBC World Service, London, England 596	5 597	6045	6190					9750		11750
	619	5 732	5 9410	9660	1					11940	
	974	0 975	9760	11760						15310	
	117	75 1194	0 12095	15070						17885	
			0 15420						21710	25750	
	177	5 1779	0 17885	21470	1200-1300		CBU, Vancouver, British Columbia	6160			
			0 25750		1200-1300		CFCF, Montreal, Quebec, Canada	6005			
1130-1200	HCJB, Quito, Ecuador 117				1200-1300		CFCN, Calgary, Alberta, Canada	6030			
1130-1200		30 1180			1200-1300		CHNS, Halifax, Nova Scotia, Canada				
	950				1200-1300		Christian Science World Service	6150	9465	11930	15285
1130-1200	Radio Thailand 119				1200-1300		CKWX, Vancouver, British Columbia				
1130-1200			0 15430		1200-1300		CFRB, Toronto, Ontario	6070			
1130-1200			5 17575	21480	1200-1300		HCJB, Quito, Ecuador		15115	17890	
- ARK TREES	216		6 ACTIONS		1200-1300		KUSW, Salt Lake City, Utah	9850		400000	a increase an
1130-1200	Voice of the Islamic Republic of Iran 71				1200-1230		Radio Australia, Melbourne	11930			11800
1135-1140	All India Radio, New Delhi 60			9675				7215			9770
			0 15320)	1200-1300		Radio Beljing, China	9530			15450
		30 1528			1200-1230		Radio Bucharest, Romania		17720		
1150-1200 M		00 2155		0	1200-1300		Radio Jordan, Amman	13655			
	177	00 1//2	0 21470)	1200-1300		Radio Moscow World Service, USSF			10000	9705
								9765			11705
4000 LIT	0 17.00 AM FOT /4.00 AM DOTI										15150
1200 UT	C [7:00 AM EST/4:00 AM PST]			1							15345
1000 1000			- 1000								15520
1200-1230	Radio Thailand 119		5 4830								17570
1200-1215	BBC English by Radio, London 60		0 11920)							17665
		00 2155		04545							17820
1200-1215			5 21485	21515							21680
1200-1225	All India Radio, New Delhi 116		r	04.400	1000 1000		Dedie DCA Jahannahum		21800		
1200-1225	Radio Netherlands Int'l, Hilversum 59		5 17575	21480	1200-1300		Radio RSA, Johannesburg	1//30	21535	21590	ř
	216	15			1						



1200-1300	Voice of America-East Asia Service	6110	9760	11715	15155	1300-1400	CBC Northern Quebec Service, Can 9625	
		15425				1300-1400	CBN, St. John's, Newfoundland 6160	
1200-1300	WHRI, Noblesville, Indiana	11790				1300-1400	CBU, Vancouver, British Columbia 6160	
1200-1300 S		9715				1300-1400	CFCF, Montreal, Quebec, Canada 6005	
1200-1300	WYFR, Okeechobee, Florida	5950	7355	11830	17640	1300-1400	CFCN, Calgary, Alberta, Canada 6030	
1215-1225	Radio Bayrak, Northern Cyprus	6150				1300-1400	CHNS, Halifax, Nova Scotia, Canada 6130	
1215-1230 S		6125				1300-1400	Christian Science World Service 6150 9465 11930 152	285
1230-1300	Radio Australia, Melbourne	11930	9770	9580	7215	1300-1400	CKWX, Vancouver, British Columbia 6080	
		7205	6080	6035	6020	1300-1400	CFRB, Toronto, Ontario, Canada 6070	
1230-1240	Voice of Greece, Athens	17550	15630	11645		1300-1400	FEBC Radio Int'l, Philippines 11850	
1230-1300	Voice of Vietnam, Hanoi	15010	12010	9840		1300-1400	HCJB, Quito, Ecuador 11740 15115 17890	
1230-1300	BBC English by Radio, London	6125	9515	9560	9600	1300-1400	KUSW, Salt Lake City, Utah 9850	
	•	9635	11710	11780	11845	1300-1400	Radio Australia, Melbourne 5995 11930 6080 60	020
		12040	15115	15390	15435		7205 9580 21525 60	035
		17695	17880	17795	21695	1300-1400	Radio Beijing, China 9530 11600	
1230-1300	Radio Bangladesh, Dhaka	15195	11705			1300-1400	Radio Bucharest, Romania 11940 15365 17850 215	550
1230-1300	Radio Berlin Int'I, East Germany	11970	15440	17880	21465	1300-1400	M-F Radio Canada International, Montreal 9635 11855 17820	
1230-1300	Radio France International, Paris	9805	11670	15155	15195	1300-1400	Radio Jordan, Amman 13655	
		17650	21635	21645		1300-1400	Radio Moscow World Service, USSR 7130 7305 7370 97	705
1230-1300	Radio Sweden, Stockholm	15190	21570	17740			9765 9875 11705 117	745
						1	11765 11840 15150 153	305
1388		W. S. W. S.	134.00	DATE: 100		1	15320 15345 15475 155	560
1300 UTC	[8:00 AM EST/5:00 AM I	PSTI					17625 17645 17665 177	700
	10:00 Am E01/0:00 Am	0.			1000	1		
	Total Am Early order Am 1	9.1			0/41		17735 17570 17700 178	810
1300-1315	Radio Berlin Int'i, East Germany		15440	17880	21465		17735 17570 17700 178 17820 17840 21660 216	810
1300-1315		11970 15400	15440 21550	17880	21465		17735 17570 17700 178 17820 17840 21660 216 21725	810 680
1300-1315 1300-1325 M-	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo	11970 15400 9590	21550			1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257	810 680 790
1300-1315 1300-1325 M- 1300-1330 S 1300-1330	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade	11970 15400 9590 11735		15325		1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US\$B130 11870 15420 153	810 680 790
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985	21550 15165 6165	15325 9535		1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US3B130 11870 15420 153 17870	810 680 790
1300-1315 1300-1325 M- 1300-1330 S 1300-1330	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade	11970 15400 9590 11735 3985	21550 15165 6165 5975	15325 9535 5995	6045		17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US3B130 11870 15420 153 17870 Voice of America-East Asia Service 6110 9760 11715 151	810 680 790 330
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985 and 5965 6190	21550 15165 6165 5975 6195	15325 9535 5995 7180	6045 7325	1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 17730 21535 21590 257 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US\$B130 11870 15420 153 17870 Voice of America-East Asia Service 6110 9760 11715 151	810 680 790 330
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985 and 5965 6190 9410	21550 15165 6165 5975 6195 9660	15325 9535 5995 7180 9740	6045 7325 9750	1300-1400 1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US\$B130 11870 15420 153 17870 Voice of America-East Asia Service 6110 9760 11715 151 15425 WHRI, Noblesville, Indiana 9465 11790	810 680 790 330
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985 and 5965 6190 9410 9760	21550 15165 6165 5975 6195 9660 11750	15325 9535 5995 7180 9740 11775	6045 7325 9750 11940	1300-1400 1300-1400 1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US\$B130 11870 15420 155 17870 Voice of America-East Asia Service 6110 9760 11715 151 WHRI, Noblesville, Indiana 9465 11790 S WRNO Worldwide, Louisiana 9715	810 680 790 330
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095	21550 15165 6165 5975 6195 9660 11750 15070	15325 9535 5995 7180 9740 11775 15105	6045 7325 9750 11940 15140	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 2172	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 9 3985 13985 6190 9410 9760 12095 15310	21550 15165 6165 5975 6195 9660 11750 15070 15420	15325 9535 5995 7180 9740 11775 15105 17640	6045 7325 9750 11940 15140 17705	1300-1400 1300-1400 1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 Radio RSA, Johannesburg 17730 21535 21590 257 Radio Station Peace & Progress, US\$B130 11870 15420 155 17870 Voice of America-East Asia Service 6110 9760 11715 151 15425 WHRI, Noblesville, Indiana 9465 11790 S WRNO Worldwide, Louisiana 9715 WWCR, Nashville, Tennessee WYFR, Okeechobee, Florida 5950 9705 11580 118	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 9 3985 13985 6190 9410 9760 12095 15310	21550 15165 6165 5975 6195 9660 11750 15070 15420	15325 9535 5995 7180 9740 11775 15105 17640	6045 7325 9750 11940 15140	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400	17735 17570 17700 178 17820 17840 21660 216 21725 2172	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330 1300-1345	Radio Berlin Int'I, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'I European Service BBC World Service, London, Engla	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095 15310 17790 21710	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21730 21535 21590 257 2173	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330	Radio Berlin Int'i, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'i European Service	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095 15310 17790 21710	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21727 2172	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330 1300-1345	Radio Berlin Int'I, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'I European Service BBC World Service, London, Engla	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095 15310 17790 21710	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21730 21535 21590 257 2173	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330 1300-1345	Radio Berlin Int'I, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'I European Service BBC World Service, London, Engla	11970 15400 9590 11735 3985 3085 6190 9410 9760 12095 15310 17790 21710 9325 15180 2310	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355	17735 17570 17700 178 17820 17840 21660 216 2162 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21727	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1330 1300-1345	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'l European Service BBC World Service, London, Engla Radio Pyongyang, North Korea ABC, Alice Springs, Australia ABC, Brisbane, Australia	11970 15400 9590 11735 3985 3985 6190 9410 9760 12095 15310 17790 21710 9325	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355 1330-1400 1330-1400	17735 17570 17700 178 17820 17840 21660 216 2162 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21727	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1345 1300-1345	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'l European Service BBC World Service, London, Engla Radio Pyongyang, North Korea ABC, Alice Springs, Australia ABC, Brisbane, Australia ABC, Kalherine, Australia	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095 15310 17790 21710 9325 15180 2310 9660 2485	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355 1330-1355	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21730 21535 21590 257 217870 21535 21590 257 21820 2	810 680 790 330 155
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1345 1300-1345 1300-1400 1300-1400 1300-1400 1300-1400	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'l European Service BBC World Service, London, Engla Radio Pyongyang, North Korea ABC, Alice Springs, Australia ABC, Brisbane, Australia ABC, Katherine, Australia ABC, Perth, Australia	11970 15400 9590 11735 3985 and 5965 6190 9410 9760 12095 15310 21710 9325 15180 2310	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355 1330-1400 1330-1400	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21725 21727 2172	810 680 790 330 1155 830
1300-1315 1300-1325 M- 1300-1330 S 1300-1330 1300-1345 1300-1345	Radio Berlin Int'l, East Germany F Radio Finland, Helsinki Radio Norway International, Oslo Radio Yugoslavia, Belgrade Swiss Radio Int'l European Service BBC World Service, London, Engla Radio Pyongyang, North Korea ABC, Alice Springs, Australia ABC, Brisbane, Australia ABC, Kalherine, Australia	11970 15400 9590 11735 3985 301d 5965 6190 9410 9760 12095 15310 17790 21710 9325 15180 2310 9660 2485 9610 2325	21550 15165 6165 5975 6195 9660 11750 15070 15420 17885 25750 9345	15325 9535 5995 7180 9740 11775 15105 17640 21470	6045 7325 9750 11940 15140 17705 21660	1300-1400 1300-1400 1300-1400 1300-1400 1300-1400 1315-1400 1330-1355 1330-1355 1330-1400	17735 17570 17700 178 17820 17840 21660 216 21725 21725 21725 21725 21725 21725 21725 21725 21725 21730 21535 21590 257 217870 21535 21590 257 21820 2	810 680 790 330 1155 830



1330-1400	UAE Radio, Dubai 153	20 17775	21605	1400-1500		CHNS, Halifax, Nova Scotla, Canada	a 6130			
1330-1400	Voice of Turkey, Ankara, Turkey 177	35		1400-1500	i	Christian Science World Service	9530 13	3760	15385	17555
1330-1400		10 15010	12010	1-1000000000000000000000000000000000000			21780			
1345-1400	Voice of Eelam (clandestine:northern	12 12 14 14		1400-1500	r .	CKWX, Vancouver, British Columbia				
101011100	Sri Lanka) 70	00		1400-1500		CFRB, Toronto, Ontario	6070			
1345-1400	BBC World Service, London, England 59		6045 6	90 1400-1500		FEBC Radio Int'l, Philippines	11850			
1343-1400	61:			10 1400-1500		HCJB, Quito, Ecuador	11740 15	5115	17800	
			9750 9			KUSW, Salt Lake City, Utah	9850	3113	17090	
								1020	6000	
			12095 15		8	Radio Australia, Melbourne	5995 11		6060	
			15420 17	THE PARTY OF THE P		Darlie Occade total disease Marie	7205 9		44055	47000
			17885 21			Radio Canada International, Montrea			11955	17820
		50 21710		1400-1500		Radio Japan, Tokyo	9505 11			
1345-1400	Radio Berlin Int'l, East Germany 119	70 15440	17880 21			Radio Korea, Seoul, South Korea	9570 97			
				1400-1500		Radio Moscow World Service, USSF				
			10110-1118				7260 7			
1400 UT	C [9:00 AM EST/6:00 AM PST]			11			9795			
	The state of the s			_			11765 11	1850	15305	15320
1400-1420	Radio Jordan, Amman 136	55					15345 15	5465	15560	17570
1400-1430	ABC, Alice Springs, Australia 23	0 (ML)					17625 17	7665	17700	17735
1400-1430		25 (ML)					17810 17	7820	17840	17860
1400-1430		50 15420	17740				21660 21			
1400-1430			17880 21	1400-1500	Ê	Radio RSA, Johannesburg	11925 21			
1400-1430		25 21780	17000 21	1400-1500		Voice of America-East Asia Service	6110 9			
	S Radio Norway International, Oslo 217			1400-1500		Voice of America-South Asia Service			9760	
1400-1430		5 7285		1400-1500		Voice of America-South Asia Service	15395	3043	3700	13203
1400-1430		05 17740		1400-1500	i.	Voice of Nigeria, Lagos	7255			
						: 1. (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				
1400-1430		00 11895		1400-1500		WHRI, Noblesville, Indiana	9465 15	5105		
1400-1445	Radio Berlin Int'l, East Germany 61			1400-1500		WRNO Worldwide, Louisiana	11965			
1400-1455	Radio Beijing, China 74			1400-1500		WWCR, Nashville, Tennessee	15690		00000	4
1400-1500	The state of the s	10 9550		1400-1500	0	WYFR, Okeechobee, Florida		9705	11830	13695
1400-1500	ABC, Brisbane, Australia 96						17640			
1400-1500	ABC, Katherine, Australia 24			1405-1500		WYFR, Talwan	11540			
1400-1500	ABC, Perth, Australia 96					A Radio Bhutan	5023v			
1400-1500	BBC World Service, London, England 59	75 6045	6190 6	95 1415-1425		Radio Nepal, Katmandu	5005 7	7165	(alt. 32	230)
	73:	25 9410	9660 9	40 1415-1500	ij.	Radio Jordan, Amman	9560			
	97	50 9760	11750 11	40 1430-1500	ř.	Voice of Hope, Lebanon	6280			
	120	95 15070	15140 15	1430-1500	ki	Radio Australia, Melbourne	11930 9	9580	7205	6080
			17790 17					5995		
			21710 25	THE COLUMN TWO IS NOT THE OWNER,	É	Voice of Myanmar (Burma)	5990v	70000		
1400-1500	Voice of the Mediterranean, Malta 119			1430-1500		ABC, Alice Springs, Australia	2310 (N	(1N		
1400-1500	CBC Northern Quebec Service, Can 96			1430-1500		ABC, Tennant Creek, Australia	2325 (N			
1400-1500	CBN, St. John's, Newfoundland 61			1430-1500		Radio Austria International, Vienna	6155 11		13730	21400
	M-A CBU, Vancouver, British Columbia 61			1430-1500		Radio Finland, Helsinki	21550 15		13/30	21490
1400-1500	CFCF, Montreal, Quebec, Canada 60			1430-1500					15150	47575
1400-1500	CFCF, Montreal, Quebec, Canada 60			1430-1500		Radio Netherlands Int'l, Hilversum	5955 13	3//0	15150	1/5/5



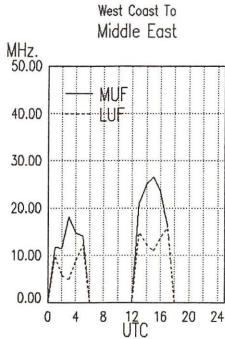
				. 6
20		e m	cy	C.
	60			
				3

1430-1500	Radio Prague, Czechoslovakia	11685	13715	15110	15155
		17840	21505		
1445-1500	Radio Berlin Int'I, East Germany	9730			
1445-1500	Vatican Radio, Vatican City	6248	7250	9645	11740

1500-1515		Vatican Radio, Vatican City		15090	17870	
1500-1515		WYFR, Taiwan	11550		Consens name or	
1500-1525		Radio Netherlands Int'l, Hilversum	5955 17605	13770	15150	17575
1500-1530		Radio Sweden, Stockholm	17740	11905		
1500-1530		Radio Berlin Int'l, East Germany	9730			
1500-1530		Radio Bucharest, Romania	15335 17745	11940	15250	17720
1500-1530		Radio Veritas Asia, Philippines	9525	15445		
1500-1550		Radio Pyongyang, North Korea	11750	9977	9640	9325
1500-1600		Radio Jordan, Amman	9560			
1500-1550		Deutsche Welle, Koln, West German	ny 9735	11965	17765	21600
1500-1555		Radio Beljing, China	7405	11795	15165	
1500-1600		Voice of Hope, Lebanon	6280			
1500-1600	F	ABC, Alice Springs, Australia	2310	(ML)		
1500-1600		ABC, Perth, Australia	9610			
1500-1600	F	ABC, Tennant Creek, Australia	2325	(ML)		
1500-1600		BBC World Service, London, England	nd 3915	5995	6180	6190
			6195	7180	7325	9410
				9740		
			Production of the Control of	11940		
				15310		
				17880	21470	21660
				25750		
1500-1600		Voice of Myanmar (Burma)	5990			
1500-1600		CBC Northern Quebec Service, Car		11720	(ML)	
1500-1600		CBN, St. John's, Newfoundland	6160			
1500-1600		CBU, Vancouver, British Columbia	6160			
1500-1600		CFCF, Montreal, Quebec, Canada	6005			
1500-1600		CFCN, Calgary, Alberta, Canada	6030			
1500-1600		CHNS, Halifax, Nova Scotia, Canad				
1500-1600		Christian Science World Service	9530 21780	13760	15385	17555
1500-1600		CKWX, Vancouver, British Columbia	6080			
1500-1600		CFRB, Toronto, Ontario	6070			
1500-1600		FEBA, Mahe, Seychelles		15325		
1500-1600		FEBC Radio Int'I, Philippines	11850			

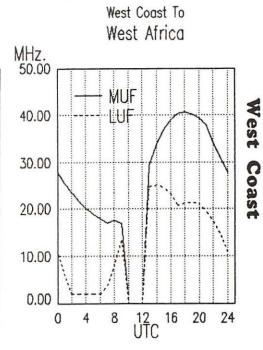
1500-1600	HCJB, Quito, Ecuador	15115	17890		
1500-1600	T-S KNLS, Anchor Point, Alaska	7355			
1500-1600	KTWR, Agana, Guam	11650			
1500-1600	KUSW, Salt Lake City, Utah	15650			
1500-1600	Radio Australia, Melbourne	5995	6035	15425	6080
		11930	7215	9580	
1500-1600	S Radio Canada International, Montre	al 9625	11720	11955	17820
1500-1600	M-F Radiodiffusion Nationale du Burund	6140			
1500-1600			11815		
1500-1600	Radio Moscow World Service, USS	R 5980	7260	7345	9565
		9705	9755	9795	9830
		9895	11705	11745	11765
		11805	11840	11850	12015
		15305	15560	17665	17735
		17810	17840	21725	15475
1500-1600					25790
1500-1600	Voice of America-Middle East Servi	ce 9700	15205	15260	
1500-1600	Voice of America-South Asia Service	e 6110	7125	9645	9700
		9760	15205	15260	15395
1500-1600	Voice of Nigeria, Lagos	7255			
1500-1600	WHRI, Noblesville, Indiana	15105	21840		
1500-1600	S WRNO Worldwide, Louisiana	11965			
1500-1600	WWCR, Nashville, Tennessee	15690			
1500-1600	WYFR, Okeechobee, Florida	5950	11830	13695	15215
		17640			
1505-1530	Radio Finland, Helsinki	9640	15185		
1515-1530		11650			
1530-1540	M-A Voice of Greece, Athens	11645	15630	17535	
1530-1600		11990	13715	17840	21505
1530-1600			15310		17825
1530-1600			21610		
1530-1600		3985	13685	17830	21630
1545-1600			11945		
1545-1600			17880		
1545-1600	Radio Pakistan		21480	17895	17580
			13665		
1545-1600	Radio Canada International, Montre				
			15325		21545
1545-1600	Vatican Radio, Vatican City	15120	17730	21650	
	INO 144 00 114 HOW (0 22 122				
1600 U	JTC [11:00 AM EST/8:00 AM	PST]			E-

Arctic Europe MHz. 50.00 MUF LUF 40.00 30.00 20.00 10.00 0.00 12 16 UTC 20 24 0



1600-1610 1600-1610

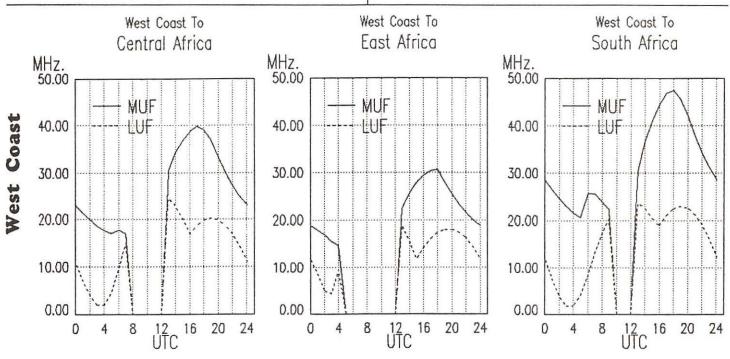
FEBA, Mahe, Seychelles Vatican Radio, Vatican City



11865 15325 6248 7250

9645 11740

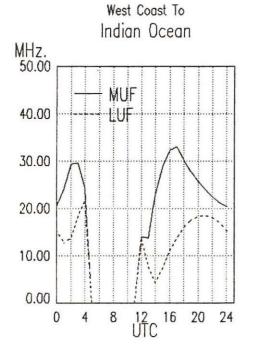
1600-1615 BBC World Service, London, England 3915 5975 5995 6180	1600-1700 Radio Moscow World Service, USSR 5980 6165 7105 7170
6190 6195 7180 7325	7220 7260 7315 7345
9410 9515 9740 9750	9510 9705 9755 9795
9760 11750 11940 12095	9830 9885 9895 11765
15070 15260 15310 15400	11840 15475 17810 17840
17640 17705 17860 17880	1600-1700 Trans World Radio via Nairobi, Kenya 11910
21470 21660 21710 25750	1600-1700 Trans World Radio-Swaziland 15210
1600-1625 M-F Radio Finland, Helsinki 15400 21550	1600-1700 Voice of America-Africa Service 7195 9575 11920 15410
1600-1630 Radio Deutsche Welle, Koln 21680 17825 15595 15105	15445 15580 15600 17785
7225 6170	17800 17870
1600-1630 Radio Pakistan 17580 13665 15605 21740	1600-1700 Voice of America-Middle East Service 3980 9700 15205 15260
17895 21480	1600-1700 Voice of America-Asia Service 7125 9645 9700 9760
1600-1630 Radio Berlin Int'l, East Germany 11970 17880	15205 15260 15395
1600-1630 S Radio Norway International, Oslo 17765 21705	1600-1700 Voice of Nigeria, Lagos 7255
1600-1630 Radio Polonia, Warsaw, Poland 6135 9540	1600-1700 WHRI, Noblesville, Indiana 15105 21840
1600-1630 Radio Portugal, Lisbon 15210	1600-1700 WINB, Red Lion, Pennsylvania 15295
	1600-1700 WRNO New Orleans, Louisiana 15420
	1600-1700 WWCR, Nashville, Tennessee 15690
	1600-1700 WYFR, Okeechobee, Florida 11830 13695 15215 15566
	17612 21525 21615 17640
	1600-1650 Deutsche Welle, Koln, West Germany 6170 7225 15105 15595
1600-1700 F ABC, Alice Springs, Australia 2310 (ML)	
1600-1700 ABC, Perth, Australia 9610	17825 21680
1600-1700 F ABC, Tennant Creek, Australia 2325 (ML)	1615-1620 Vatican Radio, Vatican City 9645 11740
1600-1700 Adventist World Radio-Asia, Guam 11980 13720	1615-1630 BBC Africa Service, London 6005 6190 9595 11940
1600-1700 CBC Northern Quebec Service, Can 9625 (ML)	15400 17880
1600-1700 CBN, St. John's, Newfoundland 6160	1615-1630 BBC English by Radio, London 3975 6125 9750
1600-1700 KSDA, Guam 11980	1615-1630 M,H Radio Budapest, Hungary 7220 9585 9835 11910
1600-1700 CBU, Vancouver, British Columbia 6160	15160 15220
1600-1700 CFCF, Montreal, Quebec, Canada 6005	1615-1700 BBC World Service, London, England 3915 5975 6180 6195
1600-1700 CFCN, Calgary, Alberta, Canada 6030	7325 9410 9740 11775
1600-1700 CHNS, Halifax, Nova Scotia, Canada 6130	12095 15070 15260 15310
1600-1700 Christian Science World Service 15385 21640	17640 17695 17860 21470
1600-1700 CKWX, Vancouver, British Columbia 6080	21660 21710 9515
1600-1700 CFRB, Toronto, Ontario 6070	1625-1645 A,S Radio Finland, Helsinki 15400 21550
1600-1700 HCJB, Quito, Ecuador 15115 17890	1630-1655 M-ABRT, Brussels, Belgium 17580 21810
1600-1700 KTWR, Agana, Guam 11650 11910 13720	1630-1700 Radio Station Peace & Progress, US\$R980 17565 12065 11910
1600-1700 KUSW, Salt Lake City, Utah 15650	15585 9705
1600-1700 Radio Australia, Melbourne 11930 6035 6020 6080	11745 11850 15320
7205 7215 9580 15245	1630-1700 Radio Netherlands Int'l, Hilversum 15375 15570
1600-1700 Radio Beijing, China 9570 15110 15130	1630-1700 RAE, Buenos Aires, Argentina 11710 15345
1600-1700 S Radio Canada International, Montreal 9625 11720 11955 17820	1645-1700 Radio Berlin Int'l, East Germany 7295 9730 15350 17780
1600-1700 Radio France International, Paris 6175 11705 12015 15360	1645-1700 S Radio Finland, Helsinki 15400 21550
17620 17795 17850	
1600-1700 Radio Jordan, Amman 9560	
1600-1700 Radio Korea, Seoul, South Korea 5975	

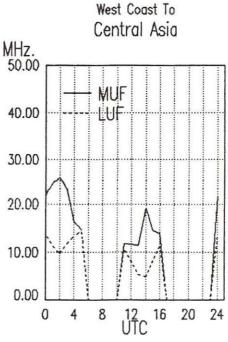


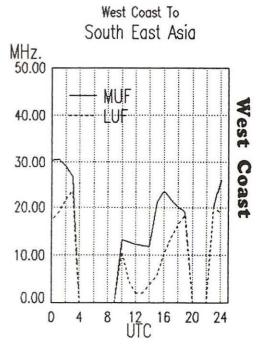
	[12:00 PM EST/9:00 AM P				- 32		
700-1705	KTWR, Agana, Guam	11650				1700-1800	Voice of America
700-1715	BBC English by Radio, London	6065	7105	9605	11750	1700-1800	WHRI, Noblesvill
700-1715	Swiss Radio Intl Europe Service(MO)	3985	6165	9535		1700-1800	WINB, Red Lion,
700-1725			15570			1700-1800	WRNO, New Orl
700-1730	BBC English by Radio, London	3975		7155		1700-1800	WWCR, Nashville
700-1730	Radio Berlin Int'l, East Germany		9730		17780	1700-1800	WYFR, Okeecho
			21705	(10000)			
700-1730			15345			1709-1730	BBC Africa Serv
700-1745	BBC World Service, London, England		5975	6180	6195		
	Dog trains control, London, Lington	7160	7325		9515	1715-1800	Radio Pakistan
		9740			15260	1715-1730	Radio Canada II
			17640	1000			
			21710	1,000	21110	1730-1740	Radio Bayrak, N
1700-1750	Radio Pyongyang, North Korea		9977	9640	9325	1730-1755	BRT, Brussels, E
1700-1800 F	ABC, Alice Springs, Australia		(ML)	0010	OULU	1730-1800	Radio Austria In
1700-1800	ABC, Tennant Creek, Australia		(ML)			1730-1800	Radio Bucharest
1700-1800	CBN, St. John's, Newfoundland	6160	(1730-1800	Radio Prague, C
1700-1800	CBU, Vancouver, British Columbia	6160				133.51.53.553.553.553.55	
1700-1800	CFCF, Montreal, Quebec, Canada	6005				1745-1800	BBC World Serv
1700-1800	CFCN, Calgary, Alberta, Canada	6030				1 400 Dec 110	
1700-1800	Radio New Zealand, Wellington	17680					
1700-1800	CHNS, Halifax, Nova Scotia, Canada						
1700-1800	Christian Science World Service		21640				
1700-1800	CKWX, Vancouver, British Columbia		21040			777074 6 10 10 10	
1700-1800	CFRB, Toronto, Ontario	6070				1800 UT	C [1:00 PM]
	WMLK Bethel, Pennsylvania	9465					
1700-1800 3-1	KUSW, Salt Lake City, Utah	15650				1800-1815	Kol Israel, Jerus
1700-1800	Radio Australia, Melbourne	11930		6020	6080	1800-1830	BBC World Sen
1700-1600	nadio Adstralia, Melbodine	7205			15245		
1700-1800	Radio Beijing, China	9500		11575	15245	1	
1700-1800	Radio Japan, Tokyo	7140		9535	11015		
	Radio Jordan, Amman	9560		9555	11015		
1700-1800 1700-1800	Radio Moscow World Service, USSR			7170	7220	1800-1830	S Radio Norway I
1700-1600	Hadio Moscow World Service, USSH	7260				1800-1830	Voice of Ethiop
		9510			9685	1800-1830	Radio Sweden,
		9795			11730	1800-1830	Voice of Vietna
						1800-1845	Trans World Ra
			11840	15405	15475	1800-1850	Radio Bras, Bra
1700 1000		17840		44000	45440		F ABC, Alice Sprin
1700-1800	Voice of America-Africa Service		9575				F ABC, Tennant (
			15580		1//85	1800-1900	
		17800	17870			1800-1900	All India Radio,
						1800-1900	CBN, St. John's CBU, Vancouve

1700-1800	Voice of America-Middle East Service 3980	6040	9700	9760
	11760	15205	15260	
1700-1800	Voice of America-South Asia Service 7125	9645	9700	15395
1700-1800	WHRI, Noblesville, Indiana 13760	15105		
1700-1800	WINB, Red Lion, Pennsylvania 15295			
1700-1800	WRNO, New Orleans, Louisiana 15420			
1700-1800	WWCR, Nashville, Tennessee 15690			
1700-1800	WYFR, Okeechobee, Florida 11830	13695	15215	
	17750	17885		
1709-1730	BBC Africa Service, London, England 6005	6190	9595	11940
	15400	17880		
1715-1800	Radio Pakistan 11570	9815		
1715-1730	Radio Canada International, Montreal21545	17820	15325	13650
	5995	7235		
1730-1740	Radio Bayrak, Northern Cyprus 6150			
1730-1755	BRT, Brussels, Belgium 5910	11695		
1730-1800	Radio Austria International, Vienna 5945	6155	12010	13730
1730-1800	Radio Bucharest, Romania 15340	15365	17720	11940
1730-1800	Radio Prague, Czechoslovakia 9605	11685	11990	13715
	15110	17840	21505	
1745-1800	BBC World Service, London, England 5975	6180	6195	7160
	7325	9410	9740	12095
	15070	15310	15400	17640
	17606	17880		

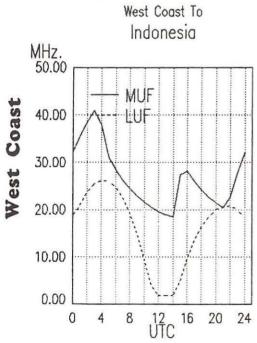
EST/10:00 AM PST] salem 11585 11655 rvice, London, England 3255 3955 5975 6180 6190 6195 7160 7325 9410 9740 11750 12095 15070 15310 15400 17640 17695 17880 International, Oslo 15310 pia, Addis Ababa 9660 6065 7265 Stockholm 12020 15010 9840 am, Hanoi adio, Swaziland 15210 asilia, Brasil 15265 rings, Australia 2310 (ML) Creek, Australia 2325 (ML) , New Delhi 11935 15360 s, Newfoundland 6160 er, British Columbia

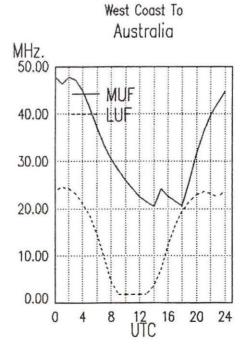


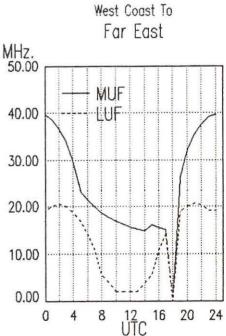




1830-1900	Radio Sofia, Bulgaria	11735	11840	15370		1900-2000		CHNS, Halifax,	, Nova Scotla,	Canada 6130)		
1830-1900	Radio Afghanistan, Kabul	9635	7215	6020		1900-2000		CFCN, Calgary	, Alberta, Car	nada 6030)		
1000 1000	riddio riddiana, melboume	6080				1900-2000		CFCF, Montrea					
1830-1900 1830-1900	Radio Australia, Melbourne	11930			7205	1900-2000		CBN, St. John CBU, Vancouv					
1830 1000	Radio Riyadh, Saudi Arabia		11840 9720			1900-2000		CBN, St. John	's Moudound		15140	15400	1/880
1830-1855	Radio Polonia, Warsaw, Poland		6135	/125	7285					9410		11750	
1830-1855	BRT, Brussels, Belgium		11695	7405	7005					6190		7160	
1815-1900	Radio Berlin Int'l, East Germany		7295	9730		1900-2000		BBC World Se	rvice, London			6005	
	Radio Bangladesh, Dhaka			0720									
1815-1900	Padio Panaladosh Dhaka	17885	11705			1900-2000	p 1	All India Radio	Now Dolla	17810	11620	11025	15200
1800-1900	WYFR, Okeechobee, Florida		13695	15215	1//50	1900-1950	- 1	Deutsche Welle	e, Koin, west			13/90	15390
	WWCR, Nashville, Tennessee	15690		45045	47750	1900-1930		Voice of Vietna			15010		
	WRNO, New Orleans, Louisiana	15420				1900-1930		Radio Sofia, B			11840		
	WINB, Red Lion, Pennsylvania	15295						Radio Portugal			15250		
1800-1900	WHRI, Noblesville, Indiana		17830					Radio Norway				01500	
1800 1000	WURL Noblesville Indiana	15205				1900-1930						0105	/115
1800-1900	Voice of America-Middle East Service			9760	11/60	1900-1930 1900-1930		Radio Japan, ⁻ Radio Kiev, Uk			11850		
1800 1000	Voice of America Middle Fast Cast				11760							15070	
			17870		17765	1900-1945		CBC, Montreal		9625			
1000-1900	voice of America-Amica Service		15580			1900-1930		Radio Alghanis Radio Omdurm		11635		0020	
1800-1900 A,S	Voice of America-Africa Service		9575	11020	15/10	1900-1930		Radio Afghanis	tan Kabul		7215		
	Radio for Peace Int'l, Costa Rica		21566			1300-1300		nadio budapes	n, riungary		6110		3300
1800-1900	Radio RSA, Johannesburg, S. Africa							Radio Budapes			11910		
	Radio New Zealand, Wellington	17680						Radio Canada			15260		
	WMLK Bethel, Pennsylvania	9465	12010	3040		1900-1925		Radio Netherla	nds Int'l Hilly		15560	17605	21685
	Voice of Vietnam, Hanoi		12010	9840		1300-1313		inadio definit ili	n, Last Gelli	17755		13143	13030
1800-1900	CBC Montreal	9625	17370	21140		1900-1915	F	Radio Berlin In	t'l Fast Germ	any 9665	13610	15145	15350
			17570		13423	1300 0		[2.00 · III	201/11.00	Am 1 011			154
			11840			1900 11	ITC	[2:00 PM	EST/11:00	AM PSTI			
		9795											
1000-1300	nadio Moscow World Service, 6661	7345			9755	1030 1033	,	alloa Ho. I, C	aubon	10470			
	Radio Moscow World Service, USSF		7105	7170	7260	1850-1855		Africa No. 1, G		15475			
	Radio Kuwait, Safat, Kuwait	13610				1845-1900		GBC Radio, Ac		6130			
	Radio Korea, Seoul, South Korea	15575						RTV Guineenne			7125		
	Radio Jordan, Amman	9560	. , 020	.0200				Voice of Greec			12105		
1800-1900 A S	Radio Canada Int'l, Montreal		17820		102.10	1830-1900		Swiss Radio In			6165	9535	
1000 1000	radio radiidia, moleculio	7205	7215		15245	1830-1900		Swiss Radio In			11955		
	Radio Australia, Melbourne	11930	6035	6020	6080	1830-1900	F	Radio Netherlar	nds Int'l. Hilve		15560	17605	21685
	KUSW, Salt Lake City, Utah	15650								17755			
	CFRB, Toronto, Ontario	6070				1830-1900	F	Radio Berlin In	t'i, East Germ	any 9665	13610	15145	15350
1800-1900	CKWX, Vancouver, British Columbia	6080								9410	11750	12095	15070
1800-1900	Christian Science World Service	9455	17770	21640		1830-1900	E	BBC World Ser	rvice, London,	England 3955	6180	6195	7325
1800-1900	CHNS, Halifax, Nova Scotia, Canada	a 6130								15400	17880		
1800-1900	CFCN, Calgary, Alberta, Canada	6030				1830-1900	E	BBC Africa Ser	vice, London		6005	6190	9630
1800-1900	CFCF, Montreal, Quebec, Canada	6005											

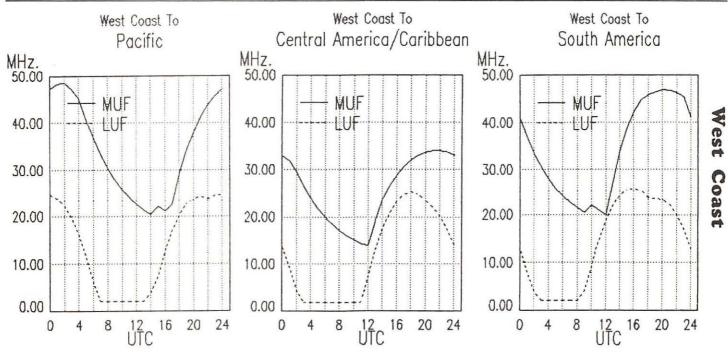






60
(1)
0
(mp
DIMBO
0
3

1900-2000 1900-2000 1900-2000	Christian Science World Service CKWX, Vancouver, British Columbia CFRB, Toronto, Ontario		17770	21640		1935-1955 1945-2000	RAI, Rome, Italy All India Radio, New Delhi	7275 9755	9710 11860	11800	
1900-2000	GBC Radio, Accra, Ghana	6130						ALCOHOLD ST			
1900-2000	HJCB European Service, Ecuador	17790	15270	21470		2000 U	TC [3:00 PM EST/12:00 PM F	'ST]			- 1
1900-2000	KUSW, Salt Lake City, Utah	15650					The state of the s				
1900-2000	Radio Algiers, Alger	9535	15215			2000-2100	Radio New Zealand, Wellington	17680			
1900-2000	Radio Australia, Melbourne	6035	11930	6080	7205	2000-2005	Vatican Radio, Vatican City	7250	9645		
		7215	9580	6020		2000-2030	BBC World Service, London, England	13255	3955	5975	6005
1900-2000	Radio Beijing, China	6955	9440			CONTROL PROPERTY		6180	6190	6195	7160
1900-2000	Radio Havana Cuba	11800						7180	7325	9410	9630
1900-2000	Radio Jordan, Amman	9560				1		11715	11750	12095	15070
1900-2000	Radio Kuwait, Safat, Kuwait	13610				1		15140	15260	15400	17760
1900-2000	Radio Moscow World Service, USSI		6030	7105	7170	1		17880			
,000 2000		9575	9685	9755	9795	2000-2030	Kol Israel, Jerusalem	9435	11605	15485	15640
		9820	9830	9860	9875			13750	1.100.00	1.2/2/2/2	
				11840		2000-2030	Radio Bucharest, Romania	9690	7105	7105	6105
		12050				2000-2030	Voice of the Islamic Republic Iran	9022			
		17570		10120	10.00	2000-2050	Radio Pyongyang, North Korea	6576	9345	9977	9640
1905-2000	Radio New Zealand, Wellington	17680				2000-2100		21566			
	A.S Radio for Peace Int'l. Costa Rica	13660	21566			2000-2100	Voice of Hope, Lebanon	6280			
1900-2000	Radio RSA, Johannesburg, S. Africa					2000-2100	All India Radio, New Delhi	7412	9755	9910	11620
1900-2000	Spanish National Radio, Madrid	15280		15395				11860	0.00	0010	
1900-2000	Voice of America-Africa Service			15445	15580	2000-2100	M-AABC, Alice Springs, Australia	2310	(MI)		
1000 2000	voice of America Amea dervice				17870	2000-2100	ABC, Katherine, Australia	2485	(11112)		
		21485	17705	17000	17070		M-AABC, Tennant Creek, Australia	2325	(MI)		
1900-2000	Voice of America-Middle East Service		9700	9760	11760	2000-2100	CBN, St. John's, Newfoundland	6160	(11112)		
1300 2000	voice of America middle East Gervin	15205	5,00	3700	11700	2000-2100	CBU, Vancouver, British Columbia	6160			
1900-2000	Voice of America-Pacific Service		11870	15180		2000-2100	CFCF, Montreal, Quebec, Canada	6005			
1900-2000	WHRI, Noblesville, Indiana	13760		13100		2000-2100	CFCN, Calgary, Alberta, Canada	6030			
1900-2000	WINB, Red Lion, Pennsylvania	15295	17000			2000-2100	CHNS, Halifax, Nova Scotia, Canada				
	S-F WMLK, Bethel, Pennsylvania	9465				2000-2100	Christian Science World Service		13770	15610	17555
1900-2000	WRNO, New Orleans, Louisiana	15420				2000-2100	Chilistian Science World Service	17770	13/70	13010	17555
1900-2000	WWCR. Nashville, Tennessee	15690				2000-2100	CKWX, Vancouver, British Columbia	6080			
1900-2000	WYFR, Okeechobee, Florida	The state of the state of	12605	15015	15566	2000-2100	CFRB. Toronto, Ontario	6070			
1900-2000	WIFN, Okeechobee, Florida	17885		13213	15500	2000-2100	KUSW, Salt Lake City, Utah	15590			
1020 1020	M-A Voice of Greece, Athens	7430	9395	9425		2000-2100	Radio Australia, Melbourne	6035	7205	7215	9580
1930-1930	Radio Finland, Helsinki	6120	10 TO	11755		2000-2030	nadio Adstralia, Melbourne	9620	6020	1215	9500
1930-1945	Radio Austria International, Vienna	5945			13730	2000-2100	Radio Beijing, China	6920	9440	0000	11715
	[제고개시] 이번 10년	9690	7195	6105		2000-2100	nadio beijing, China	15110	9440	9920	11/15
1930-2000	Radio Bucharest, Romania	The state of the s		9585		2000 2100	Radio Havana Cuba	11800			
1930-2000	Radio Budapest, Hungary	6110 11910		9385	9033	2000-2100		13610			
1020 0000	Padia Cofia Bulgaria	2012	A A A A A A A A A A A A A A A A A A A	15220		2000-2100	Radio Kuwait, Safat, Kuwait Radio Jordan, Amman	9560			
1930-2000	Radio Sofia, Bulgaria			15330		Control of the Contro					
1930-2000	Radio Yugoslavia, Belgrade	5980		11735		2000-2100	Radio Moscow British Service	9685			
1930-2000	Voice of the Islamic Republic Iran	9022	11895			1					



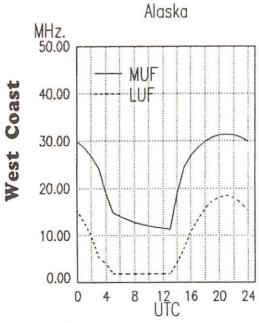
section

Have you heard what appears to be a former Radio Havana Cuba English announcer now coming over Radio Berlin International? Whoever he is, he's new, and there's a lot more changes coming up, especially at the end of March, when many stations will

2000-2100	Radio Moscow World Service, USS	SR 5905	7290	9755	9795
		9860	9895	11685	11840
		12050	15405	15425	17570
2000-2100	Voice of America-Africa Service	7195	15410	15445	15580
		15600	17785	17800	17870
		21485			
2000-2100	Voice of America-Middle East Sen	rice 6040	9700	9760	11760
		15205			
2000-2100	WHRI, Noblesville, Indiana	13760	17830		
2000-2100	WINB, Red Lion, Pennsylvania	15185			
2000-2100	WRNO, New Orleans, Louisiana	15420			
2000-2100	WWCR, Nashville, Tennessee	15690			
2000-2100	WYFR, Okeechobee, Florida	9455	11830	13695	15215
	CANADADA DA MENDAMBARAN AND AND AND AND AND AND AND AND AND A	15566	17612	17845	
		21525			
2005-2100	Radio Damascus, Syria	9950	12085		
2015-2100		9665	13610	15350	
2025-2045	RAI, Rome, Italy	7235	9575	11800	
2030-2100	BBC World Service, London, Engla	and 3955	5975	6005	6180
		6195			
		11715	11750	12095	15070
		15140	15260	15400	17760
		17880			
2030-2100	Radio Australia, Melbourne	9620	6020		
2030-2100		7190			
2030-2100	Radio Korea, Seoul, South Korea	6480	7550	15575	
2030-2100	Radio Netherlands Int'l, Hilversum	9860	13700	15560	
2030-2100	M Radio Tallin, Estonian SSR	5925			
2030-2100	Voice of Vietnam, Hanoi	12020	15010	9840	
2040-2048	M-A Voice of Greece, Athens	9425	11645	9395	
2045-2100	All India Radio, New Delhi	7412	9550	9910	11620
		11715			
2045-2100	IBRA Radio, Malta	7110	7225		
2045-2100	Radio Berlin Int'I, East Germany	6115			
2045-2100	Vatican Radio, Vatican City	9625	11700	11760	15120
2050-2100		6190	7250	9645	
2100 U	TC [4:00 PM EST/1:00 PM	PST]			
2100-2105	Radio Damascus Syria	9950	12085		

THE RESERVE OF THE PARTY OF THE		
2100-2105	Radio Damascus, Syria	9950 12085
2100-2110	Vatican Radio Vatican City	6100 7250 0645

2100-2110 Validan Radio, Validan City 6190 72: 2100-2115 BBC World Service, London, England 3955 59: West Coast To



			6195	7325	9410	11750	
				15070			
				17715			
2100-2115		IBRA Radio, Malta	7225	17715	17700	17000	
2100-2113				15110			
2100-2105		Radio Netherlands Int'l, Hilversum		13700	15560		
2100-2120		Radio Berlin Int'i, East Germany	6115	10,00	10000		
2100-2130		Radio Bucharest, Romania	9690	7195	7105	6105	
2100-2130		naulo Bucharest, nomania		7195	/105	0105	
2100 2120		Radio Budancet Hungan	5990	7000	OFOE	0025	
2100-2130		Radio Budapest, Hungary	6110		9585	9835	
0400 0400		Dadie Janea Talena		15160	44005	45000	
2100-2130		Radio Japan, Tokyo		11815	11835	15230	
			919000000000	17890			
2100-2130		Radio Korea, Seoul, South Korea	6480		15575		
2100-2130		Radio Peace & Progress, USSR	4795	5905	6145	7140	
			7215	7340	7360	7420	
			7440				
2100-2130		Radio Berlin Int'l, East Germany	9665	13610	15340		
2100-2130	M	Radio Ljublijana, Yugoslavia	5980	7240	9620		
2100-2130		Radio Sweden, Stockholm	9655	11705			
2100-2130		Swiss Radio International, Berne	9885	13635	15525	21705	
2100-2150		Deutsche Welle, Koln, West Germany				13780	
2100-2200		CBN, St. John's, Newfoundland	6160				
2100-2200		CBU, Vancouver, British Columbia	6160				
2100-2200			17680				
2100-2200		Voice of Hope, Lebanon	6280				
2100-2200		CFCF, Montreal, Quebec, Canada	6005				
2100-2200		CFCN, Calgary, Alberta, Canada	6030				
2100-2200		CHNS, Halifax, Nova Scotla, Canada					
2100-2200		Christian Science World Service		13770	15610	17555	
2100 2200			17770	13//0	13010	17555	
2100-2200		CKWX, Vancouver, British Columbia	6080				
2100-2200		CFRB, Toronto, Ontario					
2100-2200			6070				
			15590	0000	45400		
2100-2200		A STATE OF THE PROPERTY OF THE	17795	9620	15160		
2100-2200		Radio Baghdad, Iraq	7290				
2100-2200		Radio Beijing, China	6920	9920	11500	11715	
2100-2200		Radio Jordan, Amman	9560				
2100-2200		Radio Moscow World Service, USSR				6030	
			7170			9450	
			9620			9755	
			9780			9800	
				9860			
			11685	11840	11850	17720	
				15130	15405	15425	
2100-2200		Radio for Peace, Costa Rica	21566	13660			
2100-2200		RAE, Buenos Aires, Argentina	11710	15345			
2100-2200		Voice of America-Africa Service	7195	15410	15445	15580	
			15600	17785	17800	17870	
			21485				
2100-2200		Voice of America-Middle East Service	6040	9700	9760	11760	
			15205	11710)		
2100-2200		Voice of America-Pacific Service	11870	15185	17735		
2100-2200		Voice of Turkey, Ankara, Turkey	9825				
2100-2200		WHRI, Noblesville, Indiana	13760	17830			
2100-2200		WINB, Red Lion, Pennsylvania	15185				
2100-2200		WRNO Worldwide, Louisiana	15420				
2100-2200		WWCR, Nashville, Tennessee	15690				
2100-2200		WYFR, Okeechobee, Florida	9455	11830	13695	15215	
			15566	17612	17845		
			21525				
2110-2200		Radio Damascus, Syria	15095	12085			
2115-2130	M-F	BBC Caribbean Service, London		15400	17715		
2115-2130		BBC World Service, London, England			6195	7180	
		See		9410			
				15140			
2130-2200		BBC World Service, London, England				6195	
		DES TISTES SOLVIES, ESTAGNI, ENGLIS		9410			
				15260	30	12090	
2130-2145				15280			
2130-2143		BBC English by Radio, London	6125		9635		
	T-F	BBC Falkland Islands Service, Londo		1123	3000		
2130-2200				17700			
2130-2200				17790	15450	17000	
2130-2200						17820	
2145-2200				153330	9/00	,	
C 145-2200		Radio Berlin Int'i, East Germany	6115				

2200 UTC	[5:00 PM EST/2:00 PM P	ST]	2300 UTC [6:00 PM EST/3:00 PM PST]
2200-2205	Radio Damascus, Syria	15095 12085	2300-2315 BBC World Service, London, England 3915 5975 6175 6195
2200-2215 M-	AABC, Alice Springs, Australia	2310 (ML)	7325 9570 9590 9915
2200-2215	ABC, Tennant Creek, Australia	2325 (ML)	11750 11945 11955 15260
2200-2215	BBC English by Radio, London	11945 15280	17875
2200-2215 M- 2200-2225	F Voice of America-Caribbean Service		2300-2315 FEBC, Manila, Philippines 6030 2300-2330 Radio Mediterranean, Malta 6110
2200-2225	BRT, Brussels, Belgium Radio Finland, Helsinki	5910 9925 6120	2300-2330 Radio Mediterranean, Malta 6110 2300-0000 Adventist World Radio, Costa Rica 9725 11870
2200-2225	RAI, Rome, Italy	5990 7235 9710	2300-2330 BBC English by Radio, London 6110 9825 11765 11820
2200-2230	ABC, Katherine, Australia	2485	15390
2200-2300	All India Radio, New Delhi	7412 9550 9910 11620	2300-2330 Radio Berlin Int'l, East Germany 5965 9730 13690
		11715	2300-2330 Radio Norway International, Oslo 9605
	KGEI, San Francisco, California	15280	2300-2330 Radio Sofia, Bulgaria 15330 11680
	Radio Norway International, Oslo	15225	2300-2330 Radio Vilnius, Lithuania 7400 6100 9765 15180
2200-2245 2200-2245	Radio Berlin Int'l, East Germany Radio Yugoslavia, Belgrade	9730 7215 9620 9660 11735	2300-2345 WYFR, Okeechobee, Florida 5985 9505 15440
2200-2250	Radio Baghdad, Iraq	7290	2300-0000 A,S Adventist World Radio-Asia, Guam 15125
2200-2300	BBC World Service, London, Englan		2300-0000 BBC World Service, London, England 5975 6175 6195 7325
		6175 6195 7325 9410	9570 9590 9915 11750
		9570 9590 9595 9915	11945 11955 15260 17875
		11750 11955 12095 15140	2300-0000 CBN, St. John's, Newfoundland 6160
0000 0000	ODO Nathana Oceana Garden Can	15260 15400	2300-0000 CBU, Vancouver, British Columbia 6160
2200-2300 2200-2300	CBC Northern Quebec Service, Can CBN, St. John's, Newfoundland	9625 6160	2300-0000 CFCF, Montreal, Quebec, Canada 6005 2300-0000 CFCN, Calgary, Alberta, Canada 6030
2200-2300	CBU, Vancouver, British Columbia	6160	2300-0000 CFCN, Calgary, Alberta, Canada 6030 2300-0000 CHNS, Halifax, Nova Scotia, Canada 6130 15405
2200-2300	CFCF, Montreal, Quebec, Canada	6005	2300-0000 Christian Science World Service 9465 15275 15300 17555
2200-2300	CFCN, Calgary, Alberta, Canada	6030	2300-0000 CKWX, Vancouver, British Columbia 6080
2200-2300	CHNS, Halifax, Nova Scotia, Canada	6130	2300-0000 CFRB, Toronto, Ontario 6070
2200-2300	Christian Science World Service	9465 15275 15300 15405	2300-0000 KUSW, Salt Lake City, Utah 15580
0000 0000	0.000	17555	2300-0000 KVOH, Rancho Simi, California 17775
2200-2300 2200-2300	CKWX, Vancouver, British Columbia CFRB, Toronto, Ontario	6080 6070	2300-0000 Radio Australia, Melbourne 15160 15240 15320
2200-2300	KUSW, Salt Lake City, Utah	15580	17795 21740 2300-0000 Radio Japan, Tokyo 11835 15195 17810 21610
2200-2300	Voice of Hope, Lebanon	6280	2300-0000 Radio Korea, Seoul, South Korea 15575
2200-2300	Radio Australia, Melbourne	15160 15240 15320	2300-0000 Radio Luxembourg 6090
		17795 21740	2300-0000 Radio Moscow N. American Service 6045 7115 7150 9685
2200-2300	Radio Beijing, China	3985	9720 12050 15425 17605
2200-2300 2200-2300	Radio Canada Int'l Montreal Radio New Zealand, Wellington	9760 11705 11945 15440 17680	17700 17720 21470 9870 2300-0000 Radio Moscow World Service, USSR 7135 7370 9510 9790
2200-2300	Radio Havana Cuba	7140	2300-0000 Radio Moscow World Service, USSR 7135 7370 9510 9790 11800 11985 12045 15130
2200-2300	Radio Moscow World Service, USSR		15140 15295 15420 17570
		6030 6045 6055 7150	17610 17655 17775 21690
		7170 7280 9450 9620	21790
		9685 9755 9790 9820	2300-0000 Radio New Zealand, Wellington 17680
		9860 9870 11840 11850 12050 15130 15405 15425	2300-2330 Radio for Peace, Costa Rica 21566 13660 2300-0000 Radio Pyongyang, North Korea 11735 13650
		17570 17655 17700 17720	2300-0000 Radio Pyongyang, North Korea 11735 13650 2300-0000 Radio Tonga, Kingdom of Tonga 5030v
2200-2300	Radio for Peace Int'l, Costa Rica	21566 13660	2300-0000 Voice of America-East Asia Service 7120 9770 11760 15185
2200-2300	Radio Peace & Progress, USSR	4795 6145 7215 7360	15290 15305 17735 17820
	STATE OF THE PROPERTY AND ADDRESS OF THE PROPERTY OF THE PROPE	9610	2300-0000 Voice of Turkey, Ankara, Turkey 9445 9665 9685 17760
2200-2300	Radio Tonga, Kingdom of Tonga	5030v	2300-0000 Voice of U.A.E., Abu Dhabi, UAE 9600 11985 13605
2200-2300	Voice of America-East Asia Service	7120 9770 11760 15185	2300-0000 WHRI, Noblesville, Indiana 13760 17830
2200-2300	Voice of America-Eur/Pac. Service	15290 15305 17735 17820 9852 11805 15345 15370	2300-0000 WINB, Red Lion, Pennsylvania 15145 2300-0000 WRNO, New Orleans, Louisiana 15420
	carried Control	17610	2300-0000 WWCR, Nashville, Tennessee 15690
2200-2300	Voice of Free China, Taiwan	9850 11805	2300-2330 Radio Canada Int'l, Montreal 9755 11730
2200-2300	Voice of U.A.E., Abu Dhabi, United	and the state of t	2305-2355 Radio Polonia, Warsaw, Poland 5995 6135 7125 7145
0000 0000	Arab Emirates	9600 11985 13605	7270
2200-2300	WHRI, Noblesville, Indiana	13760 17830	2315-2330 BBC World Service, London, England 5975 6110 6175 6195
2200-2300 2200-2300	WINB, Red Lion, Pennsylvania WRNO Worldwide, Louisiana	15185 15420	7145 7325 9570 9590 9825 9915 11750 11765
2200-2300	Radio Algiers, Algeria	9640	11820 11945 11955 15260
2200-2300	WWCR, Nashville, Tennessee	15690	15390 17875
2200-2300	WYFR, Okeechobee, Florida	11830 13695 15215 17612.5	2330-0000 Voice of Vietnam, Hanoi 15010 12010 9840
	NATIONAL AND	17845 21525	2330-0000 Radio for Peace Int., Costa Rica 7375 (+13660 21566 M-F)
2205-2220	Vatican Radio, Vatican City	9615 11830 15105	2330-2345 BBC English by Radio, London 3915 6080 7180 11865
2230-2300	Kol Israel, Jerusalem	9435 11605 13750 15615	2330-0000 BBC World Service, London, England 5975 6110 6175 6195
2230-2300 2230-2300	Radio Polonia, Warsaw, Poland Radio Mediterranean, Malta	5995 6135 7125 7270 6110	7325 9570 9590 9825
2230-2300	Radio Sofia, Bulgaria	15330 11680	9915 11750 11765 11820 11945 15260 15390 17875
2230-2300	Radio Tirana, Albania	7215 9480	2330-0000 Radio Tirana, Albania 6120 9760 11825
2230-2300	Swiss Radio Int'I, European Service	6190	2330-0000 Swiss Radio International, Berne 6190
2245-2300	BBC English by Radio, London	7180 11945	2335-2345 M-A Voice of Greece, Alhens 9395 11645
2245-2300	Radio Berlin Int'I, East Germany	5965 9730 13690	

Editor-in-Chief Passport to World Band Radio

Sangean's New ATS-808 Portable

A few years ago, on a gorgeous day, I was strolling with my wife along the banks of the river Seine in Paris. Radio was the last thing I had on my mind...when, there it was. In an electronics store display was a neat-looking shortwave portable I had never seen -- or heard of -- before.

So much for romance in Paris. I brought the radio back to the States and inquired about to see whether any shortwave dealers had heard of this radio. No, they hadn't, but at least one -- Electronic Equipment Bank -- was interested and asked me for the name and address of the manufacturer. Naturally, I obliged, and the rest is history.

This was the Sangean ATS-803, later to be upgraded to the '803A, and now sold by the countless tens of thousands under that designation and many others, including Radio Shack's DX-440.

With the Magnavox D2935, sold outside the U.S. as the Philips D2935, having been discontinued, the '803A is now the leastcostly serious world band portable on the market. Typically, it sells for just under \$200, and it's a fine midsized portable.

Sangean also makes a variety of smaller portables, none of which stands out in the marketplace the way the '803A does. So when Sangean announced it was coming out with a new "flagship" world band radio, ears perked up. For a little more money, one assumed, something even better than the '803A would be available.

After numerous delays resulting from a problem with one of the chips in the receiver, the first limited-quantity shipments of ATS-808 receivers recently began appearing on at least some dealers' shelves. By spring of this year, the receiver is expected to be widely available in quantity.

The '808 is about the size of the Sony ICF-2003. That is, it's more compact than the '803A. It also has a simpler front-panel layout than does the '803A. Yet, it has a number of advanced-technology aspects.

Sophisticated Tuning

For example, tuning is quite versatile. In addition to a pair of up/down slewing buttons, there's a two-speed tuning knob, with the speed, thankfully, being selected by the user, not some automatic VRIT circuit. There's also a three-function keypad -default for choosing memory channels, another for direct frequency access, and yet another for selecting meter bands. The keys have exceptionally good feel and tactile response!

There are 45 memory channels in all. Of these, 18 work on shortwave.

Frequency coverage is all the way from 150 kHz to 30 MHz - no gaps. And there's also stereo FM. Although the set comes with only one speaker, it also comes with a set of earpieces and a head wand to allow for true stereo to be heard.

The operator's manual is clearly written and easy to follow. The radio also comes with a "Wave Handbook" containing schedule information that is virtually identical to that found in the 1987 World Radio TV Handbook. Presumably because Sangean is located in Taiwan, there is no schedule included for Radio Beijing.

No Single Sideband; Only One Bandwidth

There is only one shortwave bandwidth, unlike the two found in the '803A. And there are no facilities for reception of single-sideband or CW signals. On the 803A, reception of SSB and CW is not only possible, but actually quite good by portable standards.

For travel, the '808 comes with a power lock switch and a soft case to protect the set from scratches. Surprisingly, however, the '808 has no carrying strap or handle whatsoever.

Alarm and Sleep Shutoff; No On/Off Timer

Travelers often use radios as alarm devices, and also to lull them to sleep. A radio, after all, can override the sorts of traffic and adjacent-room noises that keep light sleepers awake.

For that reason, the '808 has a sleep-shutoff control. It also comes with one timed-on control that will switch on either the radio or a buzzer. However, once the timer turns the radio on, the operator has to turn the radio off by hand. The timing facility is thus along the lines of an alarm clock, rather than the sort of true on/off timer found on various other world band radios, such as the Sony ICF-2010, or a VCR.

The LCD, which is unlit, has superior contrast and reasonably large frequency numbers. It also displays either of two 24-hour clocks, neither of which displays seconds numerically. Also displayed is the band, battery strength, and signal strength (in a non-standard 1-7 scale).

Power is from six "AA" cells, two of which are for the computer. No ac power supply is provided, but there is a socket in which one with suitable polarity may be connected. Sangean offers the ADP-808, which lists for \$7.99.

Finally, there is a simple high-low tone



control and a flip-out elevation panel to place the radio at a comfortable angle.

Broad Selectivity

Performance, overall, is not in the same league as that of the better competing compact models. Selectivity, for example, is only adequate, with 5 kHz heterodynes -- whistles -- clearly audible on most channels.

Good Sensitivity; Some "Ghosts"

Spurious signal rejection is also adequate, but hardly of "flagship" caliber. False "repeats" of world band stations occur on various frequencies -- between 6.2 and 6.3 MHz, for example -- sometimes at perfectly listenable levels.

Sensitivity is fine, however. Indeed, in this regard the '808 outperforms a number of compact and even larger portables. FM performance is also quite good.

Fast Tuning Mutes Receiver

Because tuning is in 1 kHz increments, there is always the potential problem of "whoop-whoop" chuffing sounds appearing in concert with the speed in which the tuning knob is turned. A number of receivers have been faulted for this problem, so Sangean opted to avoid this problem by muting the receiver relatively greatly when the tuning knob is turned.

This does work well in eliminating "chuffing," but it also tends to mute the radio to the point where it is difficult to hear any stations without tuning quite slowly.

The Bottom Line

The kicker in all this is not the radio. It's an adequate little portable that in many ways has been carefully thought out. Rather, it's the price: \$299.95 list, or some \$60 more than the '803A. Even the '808's current street price is some \$30 or so over that of the 803A.

At a list price of around \$199.95, the '808 would be a worthy addition to the existing lineup of world band receivers. But at \$300, this set is clearly overpriced. There are similar, but better, compact offerings from Sony and Panasonic at lower prices. Even Sangean's own venerable

'803A, although it's a bit larger, is markedly superior.

It may well be that this is not the last we are to hear of this model. When Sangean's '803 first appeared, we faulted it for certain shortcomings, and not long thereafter they brought out an improved version.

It remains to be seen what, if anything, Sangean plans to do with its spanking-new '808, but possibilities range from adjustment of pricing to improvement of performance.

mt

You can hear Larry Magne's equipment reviews the first Saturday of each month, plus PASSPORT editors Don Jensen and Tony Jones the third Saturday, over Radio Canada's "SWL Digest." For North America, "SWL Digest" is heard at 8:10 PM ET on 5960 and 9535 KHz, with a repeat Tuesday at

8:30 AM ET on 9635, 11855 and 17820 kHz.

PASSPORT'S "RDI White Paper" equipment reports contain everything found during its exhaustive tests of communications receivers and advanced portables. These reports are now available in the U.S. from Universal Shortwave and EEB; in Canada from PIF, C.P. 232, L.d.R., Laval PQ H7N 4Z9; in Europe from Interbooks, 8 Abbot Street, Perth PH2 0EB, Scotland; and in Japan from IBS-Japan, 5-31-6 Tamanawa, Kamakura 247.

PC Control Over ICOM™ R7000 Receiver

The Remote Computer Scanning System™

The RCSS™ significantly enhances the ICOM™ R7000 receiver capabilities by providing automated PC control over the receiver scanning and memory functions.



Features

- Automatic detection and storage of active frequencies & other information while scanning.
- Scan using user specified Tuning Steps from 10 Hz to 100 MHz.
- Scan by Mode, Class of Service, or Type of Unit.
- Scanning now resumes upon loss of carrier with user supplied delay.
- Unattended frequency monitoring by time and date.
- Memory expanded to 1,000 frequencies.
- Monitor half-duplex communications by specifying companion frequency.
- Mouse/Keyboard driven graphic user interface.

SYSTEMS & SOFTWARE

Demo Version Available

To order or receive more information, contact us at 4639 Timber Ridge Drive, Dumfries, VA, 22026, USA. Phone (703) 680-3559, Fax (703) 878-1460. RCSS™ is available for both IBM compatible & Macintosh computers.

Regency INF10 Scanner



is found the scanner stops, allowing reception. If the listener does not want that particular frequency he presses DELETE and it will be ignored in future scan sequences.

An LCD shows the status (WX, PO, etc.) or state (TX, NY, etc.); while all law enforcement low, high and UHF band frequencies are scanned, no frequency is ever displayed.

Sensitivity of the little receiver is excellent, averaging about 1/2 microvolt throughout, and the 3 watt audio amplifier should be enough to be heard in virtually any mobile environment.

The INF10 comes with a mobile mount kit and DC power cord as well as operating instructions and a warranty registration card. It is to be found in the \$110-\$120 price range from MT advertisers.

Although labelled Regency, the Uniden Corporation of America purchased the assets of Regency a couple of years back, so it isn't unusual to observe that some Regency scanners bear a striking resemblance to Bearcats!

And so it is with the Regency INF10, a striking lookalike of the BC-1 reviewed last month, except the BC-1 allows CB channel reception as well as police. An entire series of scanners, in fact, bear striking similarities to one another, different only in minor respects.

Measuring only 5-3/16"W x 6-7/8"D x 1-5/8"H, the INF10 is intended for mobile operation, powered by 12 VDC; an optional AD 580U AC wall adaptor is available from Uniden dealers for indoor use. A Motorola antenna jack accommodates standard mobile antennas.

Conventional panel functions are present (combination volume and on/off switch, squelch control, scan/hold button, preprogrammed weather search button). Less familiar keys include STATE and POLICE, geared for the interstate driver.

As the driver enters a new state he simply presses the STATE key, either holding it down for two-letter state codes to scroll by, or by stepping one state at a time. Like the BC-1 reviewed earlier, the INF10 states move by quickly, so if you zip past your state, you have to wait for all fifty to scroll by again.

Hundreds of law enforcement frequencies on a state-by-state assignment basis are stored in ROM, scanned at some 90 channels per second. When an active frequency

GRE "SUPER AMPLIFIER"

GRE America, famous for the PRO2004 and PRO2005 (and other) scanners which they manufacture and private-label for Radio Shack, also produces their own product line. Their popular "Super Converter" (800 MHz converter) is one of these; the new "Super Amplifier" for scanners is another.

Operating from an internal 9-volt battery (not supplied), the Super Amplifier can provide up to 20 dB (adjustable) signal gain from approximately 100 through 1000 MHz. It does not enhance 30-50 MHz low band reception as found on all scanners.

BNC connectors allow the Super Amplifier to connect directly between the portable scanner and its rubber ducky antenna for increased signal strengths over its intended frequency range. In our lab tests we found the unit to be most satisfactory, providing noticeable improvement of weak signals.

The unit is not confined to portable operation; it may be connected to a desktop or mobile scanner as well. An external power connector allows a 9-volt (not 12 V!) source to operate the unit for an extended period of time.

Using a nine-volt alkaline battery in intermittent application, 24 hours of useful battery lifetime may be expected.

GRE Super Amplifier, \$59.95 from Grove Enterprises and other *Monitoring Times* advertisers.





THE INTERNATIONAL MAGAZINE FOR THE HISPANIC RADIO AMATEUR

Conozca el Interesante Contenido de Radioscan Magazine

¡Una revista editada en Español, para los radioaficionados!

...Y ya está a la venta el libro

"RADIOANTENAS"

Editado por Radioscan Corporation

Ordenelo hoy por sólo \$9.95 (+ \$2.00 por UPS in USA, ó \$5.00 por vía aérea)



YES, we are reaching the Growing Hispanic Market in U.S.A and in 21 Countries.

catalogs

The World of Electronics

t is a place where you can try out a hands-free video game controller. You can test a high-tech, hand-held copier. There is even a new 120 inch television screen -yes, that's 10 feet from corner to corner.

It's the winter wonderland of gadgets, the Consumer Electronics Show, located in Las Vegas, Nevada, and it displayed "what's hot" in electronic gadgetry for the 1990s.

Industry officials say that more than \$10 billion in orders were produced by the show. In fact, when combined with its summer counterpart in Chicago, the two Consumer Electronics Shows account for more than half the consumer electronics industry's total sales.

"The mood for 1990 is very upbeat," said show spokeswoman Cynthia Upson. "Retailers say that they expect a nice volume for the spring selling season." Factory sales for the electronics industry are expected to reach a record \$33.412 billion in 1990, up from 32.166 billion in 1989.

Love to Commute

hey dub themselves the "90s Survival Guide for Commuters." And while you have to call a number (415-420-6666) in order to get the entire catalogue, their magazine advertisement was enough to catch the attention of the "Catalogues" crew. Now here are some real gadgets.



The Shirt That Scans

Proudly announced as "The First Stereo Sweatshirt," this heavy-duty white cotton sweatshirt has a built-in stereo speaker system. Says the ad, "it surrounds you with a terrific, safe stereo sound that sets your ears free to hear everything from singing birds to sirens."

In the picture, a male model is shown using the Stereo Sweatshirt with a Walkman but we all know that it could also be used with a scanner or shortwave portable.

Have your credit card ready, call 415-420-6666, specify your size (small, medium, large, or extra-large) and prepare to depart with



\$55.95 plus \$4.50 shipping to get yours.

Pocket Converter

"Love to Commute" also offers the Statpower Pocket converter, which it claims can provide portable 115 Volt AC power from any 12 volt battery source. According to the advertisement, Statpower will run "just about anything."

It's capable of producing 200 watts of peak power and 100 watts of constant power, all in a unit that fits in the palm of your hand. Built-in safety features include complete protection against overloads.

The Statpower Pocket Converter is \$179.95 plus \$5.50 shipping from the phone number listed above.

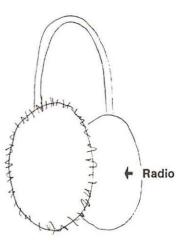
More for the Ears

n a similar note as the stereo sweatshirt is the "New Product Idea" that we received from a company called ISC. Apparently a solicitation to manufacturers, the ISC press release touts a Pennsylvania inventor who has "developed a pair of unique accessories which enable individuals to comfortably enjoy [their] favorite music and radio programs while outdoors, even in below-freezing temperatures.

The "unique" yet totally theoretical accessory is

HEARMUFFS, and, as you might have guessed, are earmuffs with speakers inside.

The HEARMUFF is not yet available to the "more than 88 million households who represent a vast potential market for this product" so please, do not write to this magazine asking for details! We can provide no more information than is available in this column! Instead.



Artist's conception of the "Hearmuff"

contact ISC, Dept. PGH-1622, 903 Liberty Avenue, Pittsburgh, PA 15222.

A Modem Filter

ALLco Inc is offering a modem noise filter that, according to company officials, allows modems to function on telephone lines that previously could not be used for reliable data transfer.

The DigiFilter works with 300, 450, 1200, 2400 or 4800 baud internal or external modems and features a variable threshold. It's a compact device, housed in an RJ-11C connector assembly and it comes with a standard modular cable and double-sided adhesive for wall or computer/modem mounting.

You can get yours for just \$29.95 from BALLco Inc., P.O. Box 1078, Snellville, Georgia 30278-1078.

Advanced Wireless FM Intercoms

Proadcasting is something that gets in your blood. Some people need to do it. That's why there are so many pirates out there. Pirates have a need to broadcast that



Midland 72-008 "Hands-Free" Intercom

is so strong that they gladly risk substantial fines and even imprisonment in exchange for the euphoria of being on the air with illegal station.

There are, of course, others among us who would also like to broadcast but who can neither afford a real broadcast station nor who feel the need so strongly as to risk jail with an illegal, high-powered station.

Those of us who fit into the latter category might consider one of Midland's line of wireless FM intercoms. This is an easy-to-obtain, reasonably affordable FM alternative to the Part 15 AM transmitters specified in Karl Zuk's article found elsewhere in this issue.

Midland, for example, has a full line of wireless FM intercoms, ranging from one to three channels each. The most appropriate in terms of getting-the-jobdone vs price is their single channel model 72-002. This unit features built-in noise filtering circuitry and a fully automatic squelch circuit to reduce interference.

As you've no doubt read in Bob Kay's column, these things seem to have incredible range and some people who use them for "broadcasting" add an antenna that (illegally) boosts their range.

For more information on these little transmitters, write Midland International Corporation, Consumer Communications Division, 1690 N. Topping, Kansas City, MO 64120.

"Catalogs" welcomes your participation. See something interesting in your pile of fresh junk mail? Clip it and send it in! Add your own comments.

Be sure to include the name of the catalog, the item's description, price and shipping information along with the phone order number. Send it to "Catalogs," P.O. Box 98, Brasstown, NC 28902.

Feeling Left Out?

Have your favorite communications (Police, Fire, etc.) moved to the 800MHz band? Are the scanners available which access this band too expensive? If you are like many scanning enthusiasts, this can be a real dilemma. For those of you who are still in a futile search for 800 MHz coverage on your hand held scanning radio. GRE America, Inc. has a product for you. Introducing the newly developed Super Converter™II which has all of the features that you have come to enjoy in our Super Converter ™ 8001 (810 - 912 MHz coverage, etc.), and more. The Super Converter ™ II has a convenient switch which allows for an instant return to normal scanning frequencies without disconnecting the unit. It is also equipped with BNC connectors for easy adaptability to your handheld scanner.



Intorducing the Super Converter 8001™ from GRE America, Inc. The Super Converter 8001™ once attached allows any UHF scanning or monitoring receiver to receive the 810 to 912 MHz band.

It has been our experience that most scanning radios suffer from a lack of sensitivity due to antenna and power limitations. Introducing the GRE

Super Amplifier ™. The Super Amplifier ™ is a compact pre-amp designed to work with scanners and it amplifies the reception of the VHF/UHF bands (from 100MHz to 1GHz) as high as 20db.

The Super Amplifier ™ has an adjustable gain which is controlled from the back of the unit and allows amplification level of up to 20db through all frequencies, equipped with a bypass switch to return to normal scanning frequencies. As with all other GRE products, you will find the quality and design of the Super Amplifier ™ to be of the highest standard.

Wide range frequency (up to 1GHz) antenna is exclusivley available from GRE America, Inc.

For more information, or a dealer near you (new dealers are welcome), contact GRE America, Inc. at the address below.

GRE America, Inc.



GRE America, Inc. 425 Harbor Blvd. Belmont, California 94002

Telephone (415) 591-1400 Outside CA: (800) 233-5973 Fax: (415) 591-2001



TIARE PUBLICATIONS SALE

SWL Forms (10 in all) List: \$10.00 plus \$2.00 shipping DX Radio Supply price: 8.00 + .90
Scanner Listeners' Handbook
List: \$14.95 plus \$2.00 shipping DX Radio Supply price: 13.95 + 1.25 1990 Pirate Radio Directory List: \$7.95 plus \$2.00 shipping DX Radio Supply price: 5.99 Catalogue 25 cents

Things you can do with Diodes

Diodes in one form or another have existed since the beginning of radio. Without them, we would not have radio as we know it today. The first receivers in the early days of radio were based on the diode action of galena or carborundum crystals, the surfaces of which were used in combination with a catswhisker contactor.

The junction of these two objects formed a diode that demodulated an amplitude-modulated broadcast signal (AM) and converted it to a pulsating dc current that caused an audio response in a pair of earphones. That crude receiver was known as a crystal set or crystal detector.

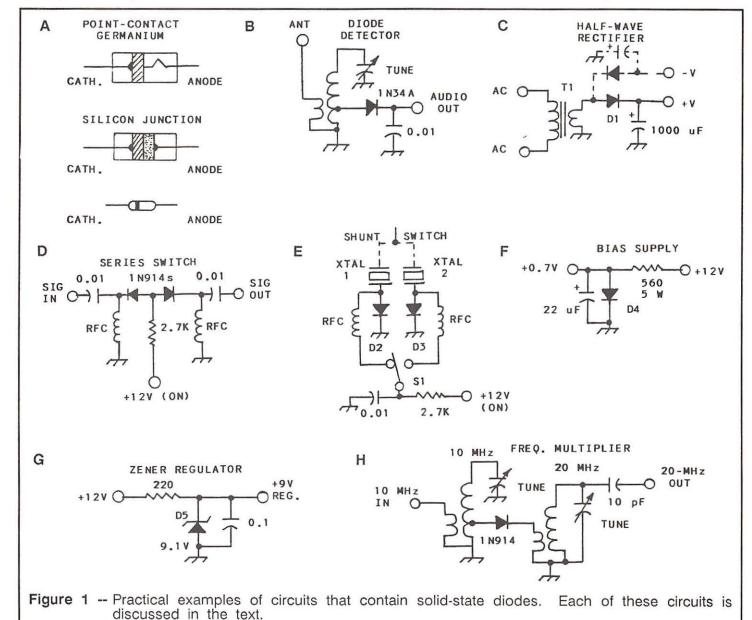
It is ironical that we had solid-state devices before we had vacuum tubes! Vacuum-tube diodes appeared, and they were used as rectifiers and detectors for decades to follow. The solid-state selenium and copper-oxide rectifiers appeared in midstream, but vanished in favor of modern solid-state diodes.

We now have all manner of solid-state diodes that are used as dc switches, powersupply rectifiers, voltage regulators (Zener diodes), signal detectors, balanced modulators and voltage-reference devices. Germanium and silicon diodes are the prevalent types

Diode Inner Structure

Modern diodes are the "point contact" or "junction" types. The former species is structured in a similar manner to the old galena/catswhisker type, because a tiny wire contactor touches a piece of germanium crystal within the glass body of the diode. The familiar 1N34A and 1N60 diodes fit this description.

A germanium diode conducts at a lower "barrier" voltage than does a silicon junction diode. This is typically 0.3 to 0.4 volt. A silicon diode conducts at approximately 0.7 volt. Also, the germanium diode exhibits



less internal capacitance than does its silicon brother.

These germanium traits make the diode ideally suited for weak-signal detection and use from VLF into the microwave frequencies. Radar receivers in WW II, for example, used germanium diodes as detectors immediately after the antenna.

Silicon diodes contain a junction or sandwich of P and N type crystal. The larger the diode the greater the junction capacitance. The small silicon diodes (such as the 1N914) have a capacitance of roughly 3.5 pF. Large rectifier diodes have much greater capacitance, owing to the increased junction size. This makes them unsuitable for signal detection except at very low frequencies.

All solid-state diodes have an internal resistance. Of major concern is the "forward This is measured from the anode resistance." to the cathode with a standard ohmmeter. Silicon diodes have resistances from, say, 5 to 15 ohms. It depends on the diode type and how it was manufactured. The back resistance (cathode to anode) is usually one to Germanium diodes have several megohms. a much lower back resistance (100,000 ohms or somewhat greater).

The combination of diode capacitance and forward resistance establish a time constant that determines how well or poorly the diode will perform at radio frequencies. The larger the time constant the lower the useful operating frequency. This time constant determines also the effectiveness of small diodes that are used as "high-speed switches." In other words, the greater the diode time constant, the slower the available switching time.

Diode Ratings

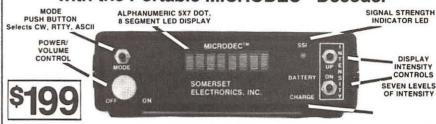
Of major concern to us is the PIV (peak inverse voltage) or PRV (peak reverse voltage). You will see both abbreviations used.

PIV or PRV ratings indicate the maximum instantaneous value of reverse voltage (cathode to anode) that can occur across the diode junction without damaging the device. One example of PRV is when rectifier diodes have a large capacitor (filter) connected to the output side of the diodes in a positive power supply, and the primary voltage to the transformer is turned off. The charge contained in the capacitor is presented to the diode cathodes while there is zero voltage on the anodes.

It is for this reason that rectifier diodes should have a much higher PRV rating than the maximum dc voltage in the power supply. I like to use, for example, 1000 PRV diodes in a 300-V power supply.

Diodes also have a maximum safe current rating. We need to pay close attention to

Add New Enjoyment To Your SW Receiver with the Portable MICRODEC™ Decoder



MICRODEC™ converts MORSE, RTTY, and ASCII to ALPHANUMERIC CHARACTERS

- Automatically tracks MORSE code speeds from 5 to 70 WPM
 Completely portable with optional NICAD rechargeable Decodes 60.67.75.100 wpm RTTY and 110. 330 BAUD ASCII.
- · Standard ASCII port to interface with your computer.

personal checks we allow two weeks for checks to clear

- Internal practice code oscillator.
- · Standard cockpit green display. (red & yellow optional)
- Power switch/Volume control/Internal speaker
- batteries mounted internally. \$29.95
- · Ultra compact and lightweight
- 1.5 H x 5.08 W x 5.25 L (1 pound w/batteries). Operates on DC voltages between 9 VDC and 15 VDC
- (9 VDC adapter provided at no cost).

SHIPPING AND HANDLING: Continental United States add \$8.50 for UPS ground. Florida residents add 6% sales tax. Other types of Express shipments and foreign destinations will be quoted on request. METHODS OF PAYMENT: MasterCard, VISA, Money Orders, Certified Checks, and Personal Checks. Please note for

SOMERSET ELECTRONICS, INC.

1290 HIGHWAY A1A, SATELLITE BEACH, FL 32937 • ORDER & FAX: (407) 773-8097

this factor when replacing defective diodes or designing a circuit. If you build a 12-V dc power supply that is used to supply a circuit that draws two amperes, use diodes that are rated at five amperes or greater. This allows plenty of safety factor. The larger diodes don't cost much more than do the smaller ones. I use 50- or 100-PRV diodes in my 12-V power supplies.

Diode temperature is an important consideration also. No diode, during operation, should more than warm to the touch. If the diodes are hot, they should be affixed to a heat sink or replaced with huskier units, assuming there is no circuit fault that is causing excessive current flow.

Diode Applications

Figure 1 shows a number of practical applications for solid-state diodes. These are simplified illustrations to aid your understanding of how the diodes may be employed.

Circuit B demonstrates the simplicity of a diode detector that may be used to convert an AM radio signal to audio. Circuit C shows how to use a half-wave rectifier to obtain a positive or negative output voltage. The diode and the filter capacitor must be reversed (dashed lines) in order to obtain a negative output.

The circuit at D shows how two diodes may be used to serve as a series dc switch. The RF chokes (RFC) prevent the signal from being lost to ground.

Figure 1E shows how diodes can be used to select two or more crystals in an oscillator circuit. This type of circuit may be used also for switching other RF components, such as tuned circuits. Figure 1E is a simple 0.7-V positive bias supply, such as those used for linear Class-A RF amplifiers that use power

transistors. Two identical diodes used in series will yield 1.4 V, and so on. D4 in this circuit should be a 50 PRV, 1-A rectifier diode.

A Zener diode is shown at G of Figure 1. The series resistor should be chosen to cause approximately 18 mA of dc current to be drawn by D5 when using 400-mW or 1-W Zener diodes. Zener diodes are available for a large number of voltage values. Detailed information about designing Zenerdiode regulators is found in The ARRL Handbook.

The final example in Figure 1 (H) shows how a small-signal diode may be used as a frequency multiplier. In this example we see a frequency doubler from 10 to 20 MHz. By selecting the proper tuned circuit after the diode we can make it work as a tripler or quadrupler. The diode output power decreases as the order of multiplication is increased.

Since the diode is a low-impedance device it is necessary to use it with the lowimpedance interface shown in Figure 1H. In our example, we may add a transistorized amplifier at the doubler output in order to increase the power of the 20-MHz signal. Some excellent examples of diode frequency multipliers are provided in Solid State Design for the Radio Amateur (an ARRL, Inc. publication).

In Summary

I have merely skimmed the surface in this discussion. Diodes have many other applications, but page space does not permit us to explore further. I suggest that you photocopy these pages and file them in your notebook for future reference.



Active Antennas

Active antennas have been around for many years. Most people think that any preamplified antenna system is an active antenna. Not so. Actually, active antennas are composed of a short whip (usually between 30 and 40 inches) coupled to an impedance-matching amplifier section designed to provide an adequate low-impedance match to the receiver coaxial antenna input over a wide range of frequency spectrum.

Robert Burhans presented a five-part series on active antennas in Radio Electronics in 1983. This is must reading for anyone interested in an in-depth look at how to design and construct an active antenna covering 150 kHz to 30 MHz.

There are few "true" active antennas on the market today. Inline Components (4521 Campus Drive, No. 113, Irvine, CA 92715) makes a couple of "real" active antennas. The Sony AN-1 and Datong AD-270 are other examples of active antennas.

While not all amplified antennas are active antennas, it has become a marketing game to designate the majority of these antennas systems as active antennas. The majority of the "active" antennas on today's market consist of a wide-band RF amplifier and a short whip antenna.

The gain of the RF amp is between 15 and 20 dB from 100 kHz to 30 MHz. This doesn't necessarily make a good antenna system. Dumping 20 dB of raw gain into the front end of a receiver is a true test of the dynamic range of the rig.

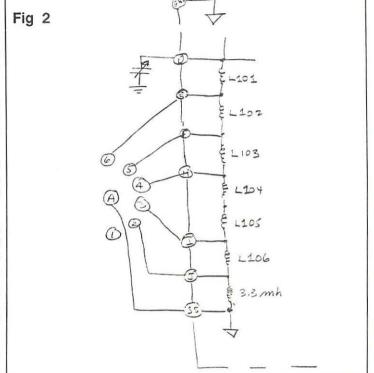
Unfortunately, most of the current rigs won't take too kindly to that tremendous RF gain at the antenna input. An increase in intermodulation distortion and poor adjacent channel performance are just two of the problems that can surface when shoving 15-20 dB of raw gain into the antenna terminals of one of today's modern receivers.

Used with some discretion, an active (amplified) antenna system can benefit anyone interested in listening to the HF spectrum. Here's why. Many times, it is impossible for the active listener to erect an external wire antenna system. Likewise, there are times when the existing outside antenna system is in use on another receiver and we NEED to have another antenna system available.

Low profile active antennas are the Godsend to the condo-bound listener saddled with the less-than-sympathetic landlord. This not only means HF listeners but scanner enthusiasts too, for there are several active antennas for the VHF/UHF listener. Among them is the outstanding Dressler ARA-900 active antenna (available from Gilfer Shortwave, 52 Park Avenue, Park Ridge, NJ 07656) for use up through the 1 GHz range.



March 1990



Heathkit has their HD-1424 active antenna that works very well across the HF spectrum. In this month's column Don Bell, WA2YQY, shows us a couple of mods that will definitely enhance the operation of this antenna system. I'll turn the column over to Don:

"When I travel, my Sony 2010 goes with me if at all possible. The Heath HD-1424 does too, but the antenna arrangement is clumsy. I had the Heath telescoping antenna available (SMA 2400-1) sold as an accessory to the IM-2410 freq counter, so it was an easy matter to remove the supplied antenna, enlarge the mounting hole, and install a chassis-mount BNC female connector (check local Radio Shack stores) to fit the new antenna. This antenna easily connects and everything fits in my briefcase, without having to carry a screw driver (see Figure 1).

"Unfortunately, the Sony 2010 drops down to 150 kHz and the Heath 1424 doesn't. It is relatively easy to add a 150-300 kHz band to the active antenna, especially when the unit is first built. The principal part needed is a 3.3 millihenry coil (Small Parts Center, 6818 Meese Dr., Lansing, MI 48911).

"Figure 2 is a partial schematic which shows the modifications. The following steps outline the modifications needed to add VLF coverage to the HD-1424.

"Locate the printed circuit board and sand the protective coating from the board in the areas shown and drill three holes (refer to Figure 3).

"Use a sharp knife to cut the foil on the dotted line. Check your work with a continuity meter to be sure you cut the foil cleanly and there are no shorts.

Monitoring Times invites you to submit your favorite projects for publication. For more information, contact Rich Arland, c/o MT, P.O. Box 98, Brasstown, NC 28902

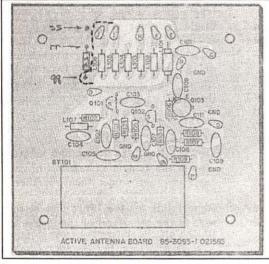


Fig 3

"When instructed to install and solder the RF coils (L101-106) to the board, install a 3.3 mH coil in holes QQ and RR. In my version, I fashioned some terminal posts from bare wire. I anticipated errors in my initial calculations of the coil's inductance, and wanted to be able to change values without removing the board.

"Install the 1-1/2 inch white wire in hole SS when the other wires are installed in hole I, J, etc. (Figure 2).

"When reinstalling the detent ring on the bandswitch, put it in position 6. This will give you a six position bandswitch instead of five. When installing the switch, temporarily mount the knob and turn the shaft fully clockwise. Install the switch full counter clockwise; the pointer should be below Band A.

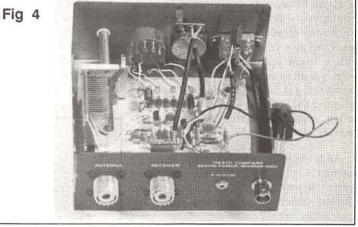
"When wiring the switch, the white wire from hole SS goes to terminal A, the white wire from hole J to terminal 2, I to 3, etc. Figure 4 shows the completed unit.

"I chose not to try and add a scale to the front panel; but if you want, consider adding it below the tuning capacitor shaft. It's continuously rotatable, so it should work well.

"That's it. My unit tunes from 150 to 250 kHz on the added band and from about 230 kHz and up on band A, providing continuous coverage from 150 kHz to 30 MHz.

"The strongest station I can hear at my location is a weather station on 194 kHz (TUK). The preamp really brings it in . . . and attenuates all manner of junk from medium and shortwave broadcasts. If your receiver tunes below 150 kHz, consider a coil of more than 3.3 mH, or perhaps two additional bands (detent 7). It could be a little tight on the PC board, but I expect at the low frequencies coupled with long leads on top of the PC board, it won't matter. Try it -- you'll like it! The end result will be a versatile RF front end for your longwave, mediumwave, and shortwave receiver."





Many thanks, Don, for the words of wisdom. This is the type of input that will make this column a success. Remember, if you have a modification that you have done, and you think that it will be of benefit to *Monitoring Times* readers, send it along to "Experimenter's Workshop" via the Brasstown, NC address. Speaking of active antennas, I have modified a Datong AD-270 and will present these mods in a future column. In the meantime, grab your soldering iron and add 150 kHz to your Heath 1424 active antenna.

Next month an article inspired by MT's own "Uncle" Skip. Till next month, 73s es gud DX.



The Quickie Quad:

More Gain-per-Element than a Yagi-Uda

It is not without good reason that the cubical quad antenna is one of the favorite beam antennas of amateur radio operators everywhere. Element for element, you usually get more signal gain from a quad than from the ever-popular Yagi-Uda type antennas. And the quad may be made using wire for the elements, whereas most configurations of the Yagi-Uda require that you use tubing for the elements.

Often the frame of the quad is made of long bamboo poles or fiberglass arms, giving the antenna an appearance something like a giant spider sitting atop a pole. But it is quite possible to construct the quad in an even easier manner by supporting its wire elements with ropes, somewhat as you do a long wire antenna (see Figure 1).

Of course, this means that the antenna will be fixed to point in just one direction, so you must be sure to point it toward the direction in which you want to use it.

If you have never used a beam antenna, I think you will be pleasantly surprised at the improvement in signal level a good beam can give you on weak signals. Also, with a beam such as the one described here, it is often surprising how much attenuation there is to signals not in the beam of the antenna! This is a great help in climinating interference from undesired stations at times.

And, happily enough, this month's antenna is not too difficult to construct and erect. So why not give it a try and see for yourself what a beam antenna can do for your weak-signal reception?

LET'S BUILD ONE!

To build this antenna you need enough wire for two full-wavelength sized loops. The wire can be any good insulated or noninsulated copper or aluminum wire that is strong enough to serve. Probably you will want somewhere around number 14 size or larger, although smaller sizes will work if they are strong enough to hold up.

You will also need a lead-in cable made of 50 to 75 ohm coax. Add some guy ropes, a center insulator, eight strain insulators for the corners, some coax-type sealer and you're ready to start.

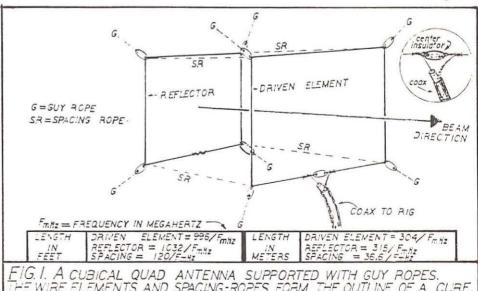
- 1. Determine the length for the reflector loop, the driven element loop, and the inter-element spacing from the formulas given in Figure 1.
- 2. Add four inches to the length found for the reflector loop in step one and cut one piece of wire to this length. This piece of wire will be made into the reflector loop.
- 3. Take the reflector-loop wire and, using a knife edge, scrape the ends bright for three inches from each end. Thread four strain insulators onto the wire and then wrap the bright three-inch ends around one another and solder them together to complete the loop (see Figure 1).
- 4. Measure the distance between the holes of your center insulator. This distance should be on the order of three inches or less, probably less. Whatever this distance is, subtract it from the length found for the driven element loop in step one. Now add four inches to this adjusted driven element length. This

- will give you the length to which you must cut the wire for the drivenelement loop.
- 5. Cut the driven-element loop wire to length and scrape each of its ends bright for four inches. Thread four strain insulators onto this wire. Then attach one end of the loop to each end of the center insulator. Do this by slipping a brightened end of wire through the hole at one end of the insulator for two inches.

Then bend the end of the wire back around the insulator end and wrap it around the remaining exposed brightened wire and solder them together.

Repeat this for the other end of the wire in the other end of the insulator. When you are finished, the loop circumference will be the appropriate length for a driven element loop as determined in step 1.

6. Now take the coaxial cable and separate the braid and center conductor on one end (the other end should have a male plug to fit your receiver). Wrap and solder the coax center conductor to the brightened wire on one side of the driven-element loop at the center insulator, and the braid to the brightened



wire on the other side (see inset circle, Figure 1). Seal the cable end against weather with coax-type sealer.

7. Cut light 1/8 inch diameter nylon or plastic guy ropes with sufficient length to separate the two wire loops by the spacing determined in step 1. Insert one end of one of these ropes into each of the strain insulators which you have sliding free on the loop. The rope is attached through the same insulator holes as the loop wires. Now tie these spacing ropes onto the insulators so that they space the insulators appropriately as shown in Figure 1.

Attach a guy rope to the remaining hole on each strain insulator. The length of these guy ropes will be determined by where your mounting points (poles, trees, towers, ground stakes, or whatever) are. Now you can give a box shape to the antenna by pulling out on these eight guy ropes simultaneously.

8. So, using these last mentioned eight guy ropes, install the antenna so that it has its characteristic box shape. Or, omit one strain insulator per loop, and shape the loops as triangles with the peaks pointing upwards. The higher you can mount the antenna, the better; but if you can't elevate it, it will even work okay near the ground. Remember to aim it in the direction from which you wish to receive signals (see Figure 1).

When orienting your beam, you should keep in mind that you can't determine true direction to distant points on the globe from an ordinary flat map. You must either use a globe (be as precise as possible, it's tricky), a great-circle map, or one of the computer programs designed for giving you great circle bearings. Great circle maps for receiving locations in the USA can be found in the ARRL Antenna Book.

 As always, don't forget lightning protection if you live in lightning country. The minimum protection you should practice is never using an antenna during a storm, and disconnecting and grounding it when it is not in use.

The Best* Just Got Better!

The Eavesdroppers™ now includes our new Zap Trapper™ Electronic Gas Tube Lightning Arrestors. Receive-only design shunts damaging transients to ground at only 1/7th the voltage buildup of the available 200 watt transmit-type arrestors, providing maximum solid state receiver protection.

Protect your investment - combine an excellent shortwave receiving antenna with the best receiver protection money can buy.

- Completely assembled and ready to use
- Only 42' overall length
- 8 trap circuits permit reception on all shortwave bands, 11-90 meters
- All connections soldered and enclosed in ultrasonically-welded, hermetically-sealed trap covers
- Includes 50' of 450 lb. test nylon rope

Model T includes 100' twinlead feedline

Model C includes weatherproofed center connector for your coax & coax sealant

- Either model \$79.95
- UPS for lower 48 states \$4.00
- COD add \$3.00, IL add 7% sales tax
- · Foreign shipping quoted

**The best...built like an antenna should be." -Larry Magne in World Radio TV Handbook
**Our best seller." -EEB in their recent ads and catalogs

"Now in use in 45 countries." – Gilfer Shortwave in 1983

Antenna Supermarket

PO. Box 563 Palatine, IL 60078 Tel (708) 359-7092 Fax (708) 359-8161

At your dealer or direct
Visa & Mastercard accepted

10. Plug the lead-in into your rig and enjoy reception of some formerly-uncopyable DX signals!

Need an easy and inexpensive antenna mast?

For testing last month's groundplane antenna, I built a version of an old-time wooden mast. It proved to be strong, works great, and the cost is moderate. The height can be made from very short on up to 40 feet or so. My 20 foot version, made of one inch by two inch softwood, has now withstood several winter storms using only three small nylon guy ropes for support!

If you'd like plans for this type of mast, send me a stamped, self-addressed business size envelope.

RADIO RIDDLES

Last Month: I asked you to give the adjective commonly used for describing antennas which resemble objects or letters which have fallen down.

Well, if we see a friend lying down too often, we may think of him/her as lazy, and that's just what we think of antennas too! Antennas which resemble objects or letters which are lying down from their normal position are called "lazy" antennas.

Examples of this are the "lazy-H," which looks like an "H" on its side, the "lazy quad," an antenna with a single loop like the driven element of the cubical quad. But with the lazy quad, the loop has "fallen over" and has all its sides parallel to the ground.

Come to think of it, since the lazy quad is best for short-haul contacts while the cubical quad described above is great for long-haul DX, it may just be that the horizontal quad picks up mainly the nearby circuits because it actually is a bit lazy after all!

This Month: What relationship is there, if any, between the cubical quad beam and the Yagi-Uda beam? Get the answer to this and much more in next month's *Monitoring Times*. Till then, Peace, DX, and 73.



ask bob

Q. My shortwave portable has an "SSB" mode; is this upper sideband (USB), lower sideband (LSB) or both? (Russ Boisvert, Johnstown, NY)

A Both. When an SSB (upper or lower sideband) station is encountered, switch to

SSB and fine tune for most natural-sounding audio.

Q. Is there still a Morse code requirement for an amateur radio license? (Henry Orloff, LA, CA) A. Sad to report, yes, although it is likely to be eliminated from an entry level license by sometime in 1991. The wheels of progress turn slowly, however, and the FCC has yet to consider all the petitions which are overwhelmingly in favor of such a license.

Q. What shortwave frequencies are used for NASA Space Shuttle missions? (Michael Kure, Needville, TX)

A. Since the shuttlecraft itself has no high frequency (shortwave) capability, only ground tracking stations will be heard on HF; voice will always be in single sideband (SSB), with upper sideband predominating.

Prior to launch, try listening to 10780 kHz (primary) and 5190 kHz (nighttime) for Cape Canaveral Air Force Station which handles all of NASA's ground tracking communications and call-ins from participating vessels and aircraft. The Air Force had to abandon their former 5810 nighttime frequency due to interference from a "spy numbers" station on 5810 and 5812 kHz.

After launch listen to various frequencies between 20.187 and 20.195 kHz for rebroadcasts of the astronauts voices to the tracking stations. Many alternative frequencies may be used as well, a comprehensive list of which is contained in my *Shortwave Directory*.

- Q. I have just gotten started in facsimile reception and wonder where I can find out who is sending virtually continuous weather map FAX near 14980.1 kHz and covering the eastern hemisphere? (William Brown, USA Signal Corps)
- A. Sounds like you may have latched on to RBV76 at Tashkent, USSR on 14982.5. An excellent guide to these FAX stations, along with listening tips, is Joerg Klingenfuss's Guide to Facsimile Stations, available from several MT advertisers.
- Q. What will happen to the scanning hobby when all the police and government transmissions are trunked or encrypted? (Wm. Herman, Indianapolis, IN)
- A. If the only thing you care to hear are encrypted agencies, you will probably take up another hobby. Others, however, will

Bob's Tip of the Month:

BC760XLT Cellular Restoration Update

While the procedure outlined last month will work to restore cellular coverage in late model BC760XLTs (BNC connector) and identical, late model, private labelled spinoffs like the BC950XLT and Regency R1600, there is one hitch: if power is disconnected while the on/off switch is left on, memorized channels will be lost. We discovered the fix for that, too.

The culprit is a chip resistor which, when left connected, discharges the memory backup cell. This 4.7K resistor, marked "472," is identified on the diagram below. It is preferably unsoldered using a solder wick or other remover, but may be crushed carefully with needle-nose pliers. Be sure not to damage the conductive foil to which it is attached.

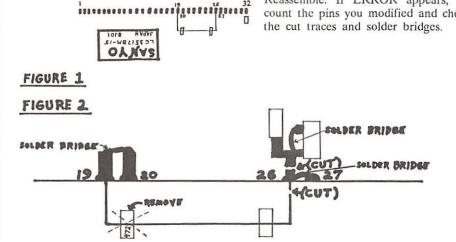
Remember, any modification done to your scanner will void the warranty. While we try very hard to make sure that information is accurate, neither Grove Enterprises nor *Monitoring Times* assumes any liability for procedures or modifications described in their publications.

If you have not yet performed the procedure as described in the February issue, step 5 below eliminates the need for the jumper wire required previously. If you have already followed last month's procedure, simply remove the resistor as described in step 6.

BC760XLT Cellular Restoration (Revised Version):

TOOLS NEEDED: fine-tip soldering iron and small-gauge rosin-core solder, small Phillips screwdriver, sharp-pointed pick or sewing needle.

- With the power cord disconnected, remove the four cover screws; remove the top cover only.
- Locate the SANYO IC as shown in figure 1 (printed upside-down with the front of the radio facing you). A long row of solder pads just above the IC identifies pins 1-32 of the microprocessor.
- Using the sharp-pointed tool, cut the two traces leading to pin 26 as shown in figure 2 to isolate that pin.
- 3. Solder-bridge pins 19 and 20 together as shown in figure 2.
- 4. Solder-bridge pins 26 and 27 together as shown in figure 2.
- Solder-bridge the two side leads of the chip transistor just above pin 27 as shown in figure 2.
- 6. Unsolder (preferable) or crush to remove the 4.7 K chip resistor marked "472" and shown in figure 2.
- Insert the power cord, turn the unit on, press MANUAL, 845., E; if 845.000 appears, the modification is complete.
 Reassemble. If ERROR appears, recount the pins you modified and check the cut traces and solder bridges.



Questions or suggestions sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you prefer a reply by return mail, you must enclose a self-addressed, stamped envelope.

continue to monitor the vast majority of transmissions which will remain in the clear -- fire, medical teams, local government, many police agencies and the myriad other licensees who don't feel the need or want to incur the expense to scramble their transmissions.

So far as trunking goes, one major scanner manufacturer has been working on a tracking scanner that solves that problem. MT will let you know when it's ready, but don't look for it soon.

Q. What is the tone used by the National Weather Service to open the squelch on their alarm receivers tuned to the 162,400-162,550 MHz channels? (Izak Luchinsky, Baltimore, MD)

A. 1050 Hz.

Q. Why is there no channel 1 on TV? (Robert Brock, Phoenix, AZ)

A. Channel 1 TV, 48-54 MHz, was reallocated by the FCC just after World War II to the land mobile services (30-50 MHz low band) and the amateur radio service (50-54 MHz six-meter band).

Q. I presently have a long outdoor dipole antenna for shortwave. Will an active antenna or preamplifier help signals come in even better? (Gavin Khoo, Singapore)

A. No. Modern receivers have excellent sensitivity and once you capture enough signal from the airwaves to overcome the receiver's own internally-generated noise, additional amplification does nothing more than raise the incoming noise (static) as well as the signal. You can accomplish the same thing by simply turning up the volume control!

Q. My AR900 scanner has a whimsical delay -sometimes it works, sometimes it doesn't. How come? (Richard Greenstein, Bowie, MD)

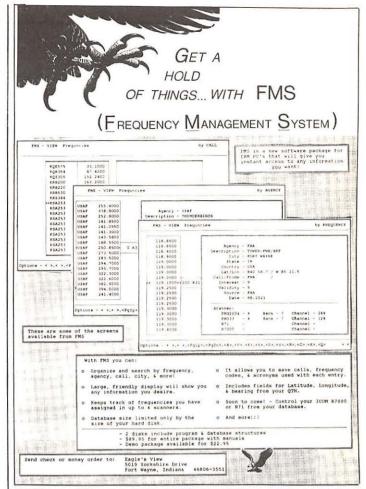
A. Several AOR scanners use the same microprocessor which has a "glitch" in the software. It may wait 6 seconds after the signal drops out before resuming scan, or it may resume as soon as the carrier drops out. There is no fix.

Q. What is a simple formula to compute the length of an antenna? (Tom Rainville, Brooklyn, CT)

A. For the length in feet of a half-wave dipole, divide 468 by the frequency in megahertz; for a quarter-wave vertical or radial element, use half that number -- 234. For VHF and UHF measurements where inches would be more appropriate, simply multiply these two numbers by 12 (inches in a foot): use 5616 for half-wave elements (as in a beam) or 2808 for quarter-wave elements (as in a ground plane or mobile whip).

Now it's easy to see just why an amateur cuts his 7 MHz antenna to 67 feet and why a 155 MHz mobile whip is 18 inches long. While divergences of several percent are acceptable, stay as close to the

values as practical.



Q. Can an automotive AM/FM antenna be used successfully for scanner listening? (Jim Kalach, Waterbury, CT)

A. The 31" car antenna is a quarter-wavelength FM-band (88-108 MHz) whip and is ineffectual at most scanner frequencies. The fact that it will hear scanner signals at all testifies to the fact that even a wet kite string will bring in some signals!

When a properly designed scanner antenna is not feasible for mobile mounting, then a suitable multicoupler can be used with a car antenna to provide local scanner reception along with continued AM/FM reception.

Q. Where can I find add-on panoramic adaptors (spectrum display units) for various frequencies? (Fred Chapman, Fredericksburg, VA)

A. Electronic Equipment Bank (EEB) of Vienna, Virginia, is an MT advertiser with a line of these accessories in stock. Check them out.

Q. Is it possible to construct a home-brew interface to allow me to copy radioteletype and Morse code off the air using my IBM-compatible computer? (Gavin Khoo, Singapore)

A. Sure; articles for such projects appear from time to time in the amateur radio magazines. But there are several commercial units on the market at such low cost (and advertising in those same magazines) that it is hardly worth the effort.

LETTERS

continued from page 3

James Kelio of Milwaukee, Wisconsin, was kind enough to write and let us know about a different kind of radio ruckus going on in the Badger State. According to local newspaper reports, farmers in the Monfort area are demanding that Christian radio station WJTY move their tower.

The farmers say that ever since the tower went in, their livestock is "fidgety, nervous and under stress." One farmer even has a videotape of his cattle "swishing their tails, even though there are no flies to bother them." How 'bout that.

Robert Merrill of Syosset, New York, writes in to say that he's found a good frequency for daytime BBC listening. "As you know," he says, "the BBC doesn't have very many good frequencies for daytime reception of the BBC in the United States or Canada. However, from 1600 UTC (11:00 am EST) to 1745 UTC (12:45 pm EST), they use 9515 kHz. It is very clear and it is the only frequency they use at this time."

Wayne Heinen of Aurora, Colorado, wants us to let you know about meeting schedule for the Rocky Mountain Radio Listeners Club (RMRLC). Mark your



Christian radio producing discontented cows

calendars for March 18, April 22, May 20, June 17 and July 15th. The meetings are held at 1:00 PM at 14949 E. Alameda Dr, Room 1B. For more information, call Wayne at 699-6335 or write 4131 S. Andes Way, Aurora, Colorado 80013-3831.

Wayne also asks that we mention that

group's sponsor, Electronic Bit's 'N Pieces, 1462 Iola Street, in Aurora. Say "hello" to Bud the next time you're in town. Wayne says they're good people.

Phil Richardson of Anchorage, Alaska, saw Rab Cave's suggestion in the January issue of *Monitoring Times* about making an overlay for Sony ICF-2010 radios. By placing an overlay on the front panel of the radio, reasoned Rob, the user could instantly know what frequency was stored on each of the '2010's memory buttons.

"I can understand an overlay -- what a job! -- but why? The '2010 has an information plate in the back. A memo sheet listing station and frequency for each of the 32 memory channels is mounted on this plate. You simply slide it out when you wish to locate a memorized station and, 'voila,' there it is.

"The memo sheets can be ordered from any Sony dealer -- that's where I get mine. They are not cheap," continues Phil, "but if you use care and put down only what you really want, two or three sheets a year will do the job.." Many thanks, Phil. That back panel is really easy to miss.



"Now Available!"

The First Annual

Amateur Radio

Equipment Buyers Guide

The Active Ham's Complete Annual Reference Master

This valuable new master directory and buyer's guide will serve you day in and day out in searching out new gear, comparing new models, locating dealers near you and mail-order retailers around the country. It'll help you buy more wisely with its multi-reference concept to help you wend your way through the buying maze.

COMPLETE PRODUCT INFORMATION

It's a single-volume source book of the latest Amateur Radio gear all sectionalized by equipment type for easy reference by the seasoned editorial staff of *CQ*:

- · Complete product descriptions.
- Technical specifications.
- · Retail prices.
- · Equipment photographs.

WHO'S WHO IN THE AMATEUR RADIO BUSINESS

It's a Buyer's Guide filled with the kind of support information you've always needed, but couldn't easily get: Dealer listings state-by-state (including branches), names and calls for key personnel, top lines carried, whether or not trade-ins are accepted or on-site repairs are made . . . and so on.

BUYING TIPS FROM THE EXPERTS

Great articles on the in's and out's of purchasing Amateur equipment. The experts give you the inside scoop on everything from

antennas to transceivers to making your first packet contact . . . and lots more

ORDER YOUR BUYER'S GUIDE TODAY!

Don't miss the single most valuable buying guide in the Amateur Radio field. Send only \$3.95 today.

Date	Number of Copies_	
Name		Call
Address		
City	State	Zip
☐ Check	☐ MasterCard	□ VISA
Card No.	E	xpires

We close this issue with a letter from Don Storck of Hemlock, Michigan. Don says he was listening to communications from the space shuttle one morning on 3860 kHz when astronauts David Boles and Marsha Evon were preparing to perform an in-flight electrocardiogram.

Marsha, talking to Houston, was describing the technique as she worked on David, who had removed his shirt for the test. "All of a sudden," reports Don, "Marsha blurted out, 'David just said that when I'm done with him, he gets to do it to me!" Houston, says our reader, didn't respond.

Knowing very well that we could get in trouble, we will follow Houston's lead.

mt

Got a comment? We welcome your ideas, responses, and opinions regarding the world of radio. Letters should be addressed to Letters to the Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902, and should include the sender's address and telephone number.

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Mar 3	Cave City, KY	Mammoth Cave ARC/ Joe Taylor N4NAS P.O. Box 858, Glasgow, KY 42141
Mar 3-4	Brownsville,TX	Texas State Conv/ David Woolweaver K5RAV 22105 77th Sunshine Strip, Harlingen, TX 79550
Mar 4	Charlotte, NC	Mecklenbury ARS/ Mary Biggs KA4EXP 8435 Rustwood Place, Charlotte, NC 28227
Mar 10	Absecon, NJ	Shore Points ARC/ SPARC P.O. Box 142, Absecon, NJ 08201
Mar 17-18	Ft.Walton Bch,FL	Playground ARC/ Frank Butler W4RH 323 Elliott Rd SE, Ft Walton Bch, FL 32548
Mar 18	Maumee, OH	Toledo Mobile RA/ Ronald Morris WB8ZIM 28141 Glenwood Rd, Perrysburg, OH 43551
Mar 23-25	Orlando, FL	N. Fla. Section Conv/ John Lenkerd W4DNU 1046 Turner Rd, Winter Park, FL 32789
Mar 23-25	Kearney, NE	NE State Conv/ Tim Lowenstein WA0PH/IVW P.O. Box 998, Kearney, NE 68848
Mar 25	Trenton, NJ	Delaware Valley RA/ Edward Vickner K2SNK 21 Running Book Rd, Trenton, NJ 08638
Mar 31	Charleston, WV	Charleston Area Hamfest/ William Kibler K8WMX 182 Monterey Dr. St. Albans, WV 25177
Apr 1	Grosse Pte Wds, N	MI/ SE Michigan ARA/ Thomas Orlicki N8HLY 15835 Novara, Detroit, MI 48205-2515
Apr 6-8	California	41st Int'l DX Convention/ Don Minkoff NK6A 12567 Brooklake St., Mar Vista, CA 90066
Apr 7	Lebanon, PA	Appalachian Amateur Rpt/ Homer Luckenbill WA3YMU 105 Walnut St., Pine Grove, PA 17963
Apr 8	Raleigh, NC	NC State Convention/ Chuck Littlewood N4HF 2005 Quail Ridge Rd., Raleigh, NC 27609
Apr 14	Bowling Green,KY	KY Colonel's ARC/ Charles Martin AB4Y P.O. Box 9781, Bowling Green, KY 42102
Apr 27-29	Dayton, Ohio	Dayton Hamvention/ Bill Schmid WD&LOI

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to: Monitoring Times Convention Calendar, P.O. Box 98, Brasstown, NC 28902.

820 Dartmouth, Troy, OH 45373



MONITORING POST PIN-UP

Officer David Dombrowski of the Tonawanda, New York, Police Department, says he's been a police officer for 13 years and a scanner owner for 20. His wife calls him "Mr. Scannerhead." (She's a dispatcher for the Kenmore Police.)

"Here's my set-up. One Cobra SR-900 with all the Town of Tonawanda government freuencies programmed, a Regency Z-60 with all the police, fire, first aid frequencies in Erie and Niagara Counties, attached to a Nite Logger to tape those special moments, a Regency TMR-8U in our bedroom to listen to area police agencies at night, especially the Kenmore police, Bearcat 50XL in my briefcase to listen to neighboring agencies while I work, a Bearcat 70XLT to carry around with me on my "off duty" hours.

"Oops, I forgot to mention the BC 760XLT, which I use for searching out new frequencies or listening to FM Communications' 21 channels. FM is a local communications

company where I do part-time work. I guess I AM a 'scannerhead.'"

Do you have a photo of you and your monitoring post you'd like to share with MT readers? As David Dombrowski said, "I saw everyone else's monitoring posts, so I figured, Why not mine?!!"





STOCK EXCHANGE

NON-COMMERCIAL SUBSCRIBER RATES: \$.25 per word - Subscribers only. All ads must be paid in advance to Monitoring Times.

All merchandise must be personal and radio-related.

COMMERCIAL RATES: \$1.00 per word payable with ad

1-3/4" SQUARE DISPLAY AD: \$35 per issue, payable in advance. Send cameraready copy or copy to be typeset (reverse type not available).

Ads for Stock Exchange must be received 45 days prior to the publication date.

Monitoring Times assumes no responsibility for misrepresented merchandise.

INDEX OF ADVERTISERS

ACE Communications		19
Advanced Electronic Technologies 53		
Alpha Delta		39
Antenna Supermarket		97
Antennas West		25,46,91
Antique Radio		16
Bob's Publications		41
Communications Electronics 2		
CQ Communications		100
Datacom		67
Data RX		23
DX Computing		5
DX Radio Supply		41,51,53,91
Eagle's View		99
Electronic Equipment	Bank	35
Gilfer Shortwave		9
GRE America		49,91
Grove Enterprises		31,55
Ham Radio magazine		95
ICOM America		Cover IV
MilSpec Communicatio	ns	43
Monitoring Times		Cover III
OPTOelectronics		Cover II
Palomar Engineering		9
Radio Electronics		17
Radio Scan		89
Radio Shack		15
Somerset Electronics		93
Systems & Software		87
Tiare Publications		23
Universal SW Radio		45

When readers are in the market, they look here to find your ad ... Will it be here?



For Sale: GRUNDIG SATELLIT 500, like new, original carton, manuals, AC adapter - \$400. Victor Orlando, 1711 Robinson Ave., Havertown, PA 19083, [215] 853-2878.

JRC NRD-525 receiver <u>ABSOLUTELY</u> <u>MINT</u> condition. Listen to the best! \$825. Call [305] 872-9106 after 6 p.m. or leave message. Ken (KA1ZT/4)

WANTED: SONY ICF6700/6800. SELLING HALLICRAFTERS SX-28, good condition, needs electrical repairs, includes manual and matching speaker -\$75. S. MARSH, 1310 Garford Ave., Elyria, Ohio 44035.

HELP: Need frequency control/scan program for an NRD-515. Dead ends so far, so any info will be greatly appreciated. Willing to pay for program. Mark Gribble, P.O. Box 2959, Alexandria, VA 22301.

KENWOOD R2-1 wideband receiver and Micronath 12VDC regulated power supply. Both are mint, original boxes, under warranty - \$450 includes shipping. [203] 746-7663.

Save \$300 on ICOM R71A-HPXF with remote, original box, manual, in mint condition. Aligned and fully upgraded by EEB - \$800. [703] 503-8018 anytime.

"SUPER CONVERTOR" 11 8002 - as new - \$75 P.P. [913] 299-8932. Harry Simpson, P.O. Box 12096, Kansas City, Kansas 66112.

For Sale: COMMODORE 64 computer, MFJ-1225 interface, MFJ software & AEA SWL Text cartridge. Allows HF reception of Baudot, ASCII, ARQ, FEC, and CW. \$175 includes shipping. J.L. Metcalf [606] 365-9042.

YAESU FRG-9600 - \$325. UNIDEN/ REGENCY 200 Ch. R4030/200XLT Handheld - \$185. UNIDEN BC760XLT -\$185. AV801 A/T antenna 25-950 MHz -\$28. Shipping included. Keith [407] 260-2937.

YAESU FRG-8800 with 4 kHz wide filter. Perfect condition, original carton and manual - \$475. Bill Butler, RD1 Box 303, Reinholds, PA 17569 [215] 678-6729.

WANTED: DRAKE R-7A receiver and accessories. Alan N4LUS [301] 229-7069 evenings.

Wanted: RADIO FREQUENCY JAM-MING: Knowledge and/or equipment, also highly sensitive hearing devices: surveillance or medical. Eugene Dell, 300 Bentwood Ave., Johnstown, PA 15904.

CAVEAT: Franklin-Belle/Antennex

A letter received at press time from Jack L. Stone, President of Franklin-Belle Publishers, publishers of antenneX of Corpus Christi, Texas, states that they have ceased operation and are returning checks uncashed to subscribers.

HUGE SHORTWAVE

- ➤ Shortwave Receivers
- ➤ Antennas & Headphones
- ➤Tuners, Preamps, Filters
- ➤RTTY & FAX Equipment
- ➤ Books & Accessories

\$1 to R

Send Universal Radio 1280 Aida Drive Reynoldsburg, OH 43068

TABLE TOP ACTIVE ANTENNA FOR SHORTWAVE RECEPTION

Provides 15 to 25 db gain from 2 to 30 Mhz. 23 high. Complete with adapter cables and power supply. Simple, compact, and efficient. Great for use with full size or portable receivers Send for information today

\$34.95 + \$3.00 Shipping/Handling

CHILTON PACIFIC LTD 5632 Van Nuys Blvd Ste# 222 Van Nuys, CA 91401

BUGGED? WIRETAPPED?

Find out fast! Factory direct countermeasures equipment catalog \$1.

CAPRI ELECTRONICS

P.O. Box 589A Bayfield, CO 81122 (303) 884-9084

HEAR ALL THERE IS TO HEAR WHERE YOU LIVE

25 MHz - 1500 MHz Frequency Search Service Send SASE to:

HEALD

6886 Jefferson St. North Branch, MI 48461

Heald's Scan-Rail Heald's Scan-Air

\$9.95 \$9.95

RADIO ASTRONOMY

THE RADIO OBSERVER, a monthly 24-page "how-to-do-it" amateur radio astronomy magazine. Annual subscription \$24

We are also suppliers of technical books, components and modules for the radio astronomy discipline.

For a sample magazine and a current brochure send \$2 to:

BOB'S ELECTRONIC SERVICE 7605 DELAND AVE. FT. PIERCE, FL 34951 Phone: (407) 464-2118



twenty-

Would you pay twenty-five cents if it would help you hear more stations? One quarter (cash only) is all it takes to get one of the most comprehensive book catalogues in the radio business.

DX Radio Supply, P.O. Box 360, Wagontown, PA 19376, We're books. Only books. And we do it better.

NEU-COMM SCANNER HDQTRS

WE SELL THE BEST ANTENNAS AND CASES FOR WE SELL THE BEST ANTENNAS AND CASES FOR YOUR SCANNING NEEDS. A CUSTOM CUT ANTENNA WILL ALWAYS WORK BETTER, FREG AVAILABLE FROM 25 MHZ TO 900 MHZ UP TO 4 db GAIN. MARCH SPECIALS CUSTOM TOP OUALITY LEATHER CASE AVAILABLE FOR MOST SCANNERS INCLUDING BC-100/200. THESE ARE PROFESSIONAL CASES. THE BEST. WE NOW STOCK MORE SCANNING ACCESSORIES THAN EVER ANTENNAS BASE-MOBILE. SCANNER SALE FOR MARCH BC 200XLT \$239.95; BC-100 \$204.95; LARSON, ANTENNA SPECIALISTS, MAXROD, ORA. COBRA. REGENCY, UNIDEN, RADAR DETECTORS. CB'S, ALL AT DISCOUNTED PRICES, MANY MORE. WRITE: CATALOG. 75 STAMPS.

NEU-COMM, 1240 RIVERBREEZE BLVD ORMOND BEACH, FLA 32176-4154 CALL: 1-904-441-6956 MON-SAT 10AM TO 8PM

RADIO HALLH COMMUNICATIONS MONITORING ASSOCIATION

Since 1975 "The Radio Club for Scanner Owners"!

For Information Write: R. C. M. A.. **BOX 542** SILVERADO CA 92676-0542

Tired of all the

oicegale II Receiver Noise Reduction

List \$199.99 Factory direct \$159.95 \$3 50 shipping

SASE for our free catalog or include \$3 (credited toward purchase) for a 30 minute demo cassette!

MAR

R1 Box 386, Alexandria, IN 45001

DX 'ability!

The MAP improves your receiver's SELECTIVITY

and AUDIO QUALITY without modifica

Wide and Narrow Bandwidths

. Works with 455 kHz IF receivers

Synchronous Detection

· Easy To Install

KIWA

-=:

.

9815 - 61st. South Scattle, WA 98118 206 - 722 - KIWA Write or call for Free information

CB RADIO OWNERS!

We specialize in a wide variety of technical information, parts and services for CB radios, 10-Meter and FM conversion kits, repair books, plans, high-performance accessories. Thousands of satisfied customers since 1976! Catalog \$2.

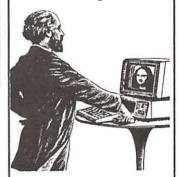
CBC INTERNATIONAL

P.O. Box 31500MT, Phoenix, AZ 85046

Largest selection of scanner frequency guides (federal, military, police, aero, etc.); AM/FM/TV broadcast directories; HF "ute" directories; Books on espionage, covert ops., bugging, wiretopping, surveillance, clandestine radio, & more! BIG FREE CATALOG!

> CRB RESEARCH P.O. Box 56-MT Commack NY 11725

You Don't Have to Create a Masterpiece



to write for the Monitoring Times!

We're looking for people with a story to tell, knowledge to share, enthusiasm for the hobby! Got an idea? Share it with the editor -- Write Larry Miller, Managing Editor, P.O. Box 98, Brasstown, NC 28902.

PRO-2004/5 Search and Store Modules

- Automatically find elusive frequencies. Internal no-holes installation, keyboard control, retain all present functions.
- Dual-mode Power Model PS-90 stores in the main memory channels with a DIP switch adjustable limit to 255 channels or only in the ten monitor ch. - \$44.95
- Model SS-45, Ten monitor ch. \$24.95 Wired/Tested/Postpaid (US & Canada) Check or MO, US funds, NC add tax

KEY RESEARCH POB 5054M, CARY, NC 27511

QSL's.....

A whole new look in QSL cards: FULL COLOR! Send \$1.00 for samples (refunded with order) to: Lakeside QSL P.O. Box 43043

Seven Points, Texas 75143

REPAIRS & **MODIFICATIONS**

SCANNERS, MONITORS & RECEIVERS

ALL WORK GUARANTEED

DROMEDARY TECHNICAL SERVICES

141 Jackson Road Roopville, Georgia 30170 404-854-8846

An Electronic SHORTWAVE MAGAZINE "Los Numeros" On-Line

HAVANA MOON

• Features • Departments • Special Interests • lewisletters • Software • FREE International E-Mail • The Usenet • Safurday Night Live With Havana Moon • Continual Updates • The Use



Join in The Fun — Call Today
Based On PORTAL
The AFFORDABLE On-Line System
Call 408/973-9111
Reaching Over Thirty Countries

HAM RADIO Q&A MANUAL

Contains all 1,932 questions, multiple choices and answers used in all FCC Amateur Radio licenses, Novice—Extra Class. 59 95 postpaid. Money-back guarantee. VISAMC orders accepted 10:00 a.m.-2:00 p.m. (817) 548-9594...or send check to: W5YI, P. O. Box 565101, Dallas, TX 75356.

HAM SELF-STUDY COURSE

Ham Radio Beginners now talk worldwidel Everything you need to become a ham operator. 112-p textbook, 2 audio code teaching sates. and more, \$21-95 postpad, VISA/MC or check! Money-back guarantee.

This could be ad! W5YI, P.O. Box 565101, Dallas, TX 75356.

Closing Comments.

The Rise and Fall of Amateur Radio

In 1928, Paul Segal, W9EEA, wrote the Amateur's Code, a set of lofty ideals to which amateur is considerate... never knowingly operates in such a way as to lessen the pleasure of others. The amateur is friendly... patient operating when requested... advice and counsel to the beginner... cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit."

I recall that spirit when my interest in ham radio was first sparked some 40 years ago. Dave Crossley (W8BCO) and Tommy Tabler (W8WZH) invited me to their homes, let me talk on their rigs, taught me the theory, answered my questions, helped me with my code, welcomed me to the airwaves when I finally got my license. Here were grown-ups taking the time to encourage a kid to realize his dream. I was an apprentice; they were my mentors. To them I am eternally grateful.

For many years I have carried the torch, helping others into the magical world of radio communications. But now ham stores sell high-tech imported radios, not parts. Radio Shack has discontinued their code practice oscillators and keys, and their stores are staffed by non-technical salespersons. Mailorder parts houses are run by vendors, not service-oriented hobbyists.

Even the cohesion of the American Radio Relay League has disintegrated. Years of self-indulgent opposition to a code-free license has taken its toll. Even after the League finally capitulated when non-members were well on the way to establishing such a license, ARRL representatives at a recent hamfest openly confronted newcomers by wearing buttons reading, "SHUT UP AND LEARN THE CODE!"

It is tempting to point the finger of amateur radio's demise at the League, at competitive technology, at the code requirement and on and on. But there is one bit of introspection that hams seem to ignore: our image.

This past weekend I happened to tune to 14313 kHz, home of the International Maritime Mobile Service Net and, for nearly three years now, a ham war zone between old-guard territorialists.

During those few minutes of listening I was ashamed to be a ham. I have never heard such a trashbin of jeering and catcalls, physical threats, profanity and obscenity, ethnic slurs, name calling, jamming, whistling, belching and bathroom sounds, infantile chanting and other degenerate outbursts.

Other hams who happened to stumble across this festering pustule were equally disgusted. One commented, "This sounds like CB"! No; CB has never sounded this bad. Another ham reflected, "Now I know why they call this 'amateur' radio"! Right on target.

I envisioned at that moment a young boy or girl, inspired by the lofty portrayal of amateur radio as a benevolent, international fraternity of friendship, accidentally tuning across that frequency. What a dreadful thought! I felt guilty by association, fearful that by possessing an amateur radio license, I might be equated with these dregs.

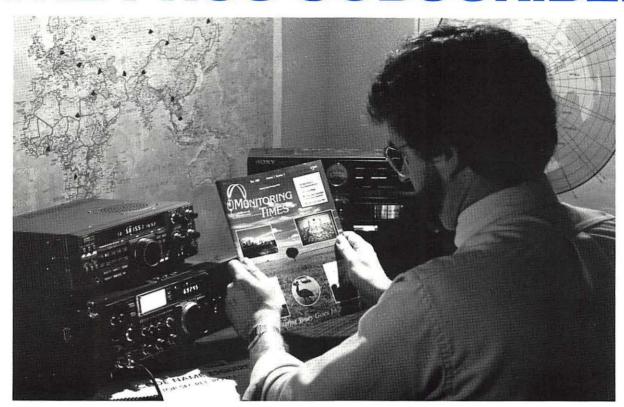
The FCC is aware of the problem. Since amateur radio is required by law to be self-regulating, the Commission has ordered the adversaries to meet and sort out their differences. But this group will never arbitrate; compromise is not part of their vulgar vocabulary.

Amateurs around the country shrug their shoulders, incredulous as to why our numbers are shrinking and our frequencies are being taken away for use by other services. But instead of blaming some uncontrollable, external forces for killing amateur radio, we should look much closer. Perhaps, like a cancer, ham radio is dying from within.

- Bob Grove, WA4PYQ Publisher



THE PROS SUBSCRIBE.



SHOULDN'T YOU?

Several professional monitoring agencies, in fact, have subscriptions to Monitoring Times. That's because every month Monitoring Times offers the latest in:

- International Broadcasting
- Utility Monitoring
- Scanners
- Shortwave and Longwave
- Satellites
- Electronic Projects
- Listening Tips
- Frequency Lists
- Broadcasting Schedules
- News-breaking Articles
- Features
- Exclusive Interviews
- Insights from the Experts
- New Product Reviews & Tests

Jammed with up-to-date information and concisely written by the top writers in the field, **Monitoring Times** is considered indispensable reading by top government agencies. From longwave to microwave, if **you** are interested in communications, **Monitoring Times** is your foremost guide to international broadcasters; new equipment and accessories; profiles of government, military, police and fire networks; home projects; and tips on monitoring everything from air-

to-ground and ship-to-shore to radioteletype, facsimile and space communications.

Order your subscription today before another issue goes by: only \$18 per year in the U.S.; \$26 per year for foreign and Canada. For a sample issue, send \$2 (foreign, send 5 IRCs).

	OPINIO	TIMES

P.O. Box 98 Brasstown, N.C. 28902

Your authoritative source, every month.

☐ Yes, begin my subscription to Monitoring Times. I've enclosed a check. ☐ Send me a sample issue. Enclosed is a check for \$2. ☐ For MC/VISA orders, call 704-837-9200.

Name Street

City State Zip

Introducing Wide Band Receivers...

ICOM has broken the barriers with it's new line of wideband receivers built to go the distance. Introducing the IC-R1 handheld receiver, the IC-R72 HF receiver and the IC-R100 multi-purpose receiver.

IC-R1. The smallest wideband handheld available today, the IC-R1 continuously covers 100kHz—1300 MHz with AM, FM and Wide-FM modes. This tiny receiver measures just 1.9"W x 4.0"H x 1.4"D.

Easy operation is a snap with the IC-R1's Dual Frequency Selection (direct keyboard and rotary tuning). 100 memories and a 24hour clock completes the world's smallest full-featured handheld receiver.

IC-R100. Install the IC-R100 at home or in your car. Listening pleasure is guaranteed with continuous coverage from 100kHz—
1856MHz in AM, FM and wide FM modes. Monitor VHF air and marine bands, emergency services, government as well as amateur stations. 121 fully programmable memory



channels, multiple scanning system, an automatic noise limiter, built-in preamplifier and attenuator, clock with timer and built-in backup lithium battery make the IC-R100 the perfect package for mobiling or base operation.

IC-R72. The IC-R72 continuously receives 100kHz-30MHz in SSB, AM and CW modes with very high sensitivity. An optional UI-8 provides FM reception. Additional

features include: Noise blanker, five scanning systems, AC/DC operation, internal backup battery, built-in clock and ICOM's DDS System. The IC-R72 boasts a 100 dB wide dynamic range while an easy-to-access keyboard provides convenient programming versatility. The easy to operate IC-R72 is superb for short wave listeners.

The IC-R1, IC-R72 and IC-R100 join ICOM's current line of professional quality receivers... the IC-R71A, IC-R7000 and IC-R9000. ICOM... expanding the horizons to bring you better technology, today. See the complete line of quality ICOM receivers at your local authorized ICOM dealer.

For a brochure on this or any other ICOM product, call our Toll-Free Literature Request Hotline 1-800-999-9877.

First in Communications

...That Go The Distance.

